

April, 1986

HAWAU-Q-85-001

A SURVEY OF LAND AND ENVIRONMENTAL LAWS AND BUSINESS/
ECONOMIC FACTORS APPLICABLE TO THE SITING OF A MANGANESE
NODULES PROCESSING PLANT IN THE PACIFIC BASIN/RIM:
AUSTRALIA, CANADA, COLOMBIA, ECUADOR, FIJI
AND THE PHILIPPINES

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**PART I: A SURVEY OF LAND AND ENVIRONMENTAL LAWS APPLICABLE TO
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SELECTED PACIFIC BASIN/PACIFIC RIM COUNTRIES:
AUSTRALIA, CANADA, COLOMBIA, ECUADOR, FIJI AND THE
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PREFACE AND ACKNOWLEDGEMENTS

The concept of this report was developed by our colleague, mineral mining and engineering expert, manager and critic Raymond W. Jenkins during his latest and last career as a mining consultant to the Hawaii State Department of Planning and Economic Development. His broad experience was largely responsible for the choice of countries as well. To him we are deeply indebted. Recurrent health problems forced him to abandon his plans to take an active part in this project in late 1983, and his subsequent death in 1984 was a blow to us both personally and professionally. To him we dedicate this report.

The unflagging research efforts of our student assistants in 1983 and 1984 contributed immeasurably to this study and we wish to acknowledge their assistance:

Part I: (Richardson School of Law)

Linda Birn:	Australia
Richard Carlisle:	Philippines
Grace Kido:	Ecuador
Pam Larson:	Australia
Robert Lombardi:	Fiji
Ted Pettit:	Canada and the Philippines
Jodie Roeca:	Canada
Keith Young:	Colombia

Ted Pettit in particular labored over many of the technical aspects of this study, especially the lengthy bibliographical appendices.

Part II: (East-West Center)

James Otto:	Research Fellow
Jean Brady:	Research Fellow
Pamela Gring:	Research Intern
Lynne Rodgers:	Student Help

Our thanks also to the secretarial staff of The William S. Richardson School of Law and in particular to Dora Yamada who has typed each draft of Part I of this report, and in particular the case studies, at least once, together with countless revisions, additions and corrections, and to Lillian Shimoda at the East-West Center who typed Part II. We are also grateful to Alan Sasai, the Law School's fiscal officer, for his help in keeping our travel, duplicating, student stipend and other accounts in order and running smoothly for these past two years, and to our Spanish translator, Ms. Gaby Hanna, lecturer in the University of Hawaii's Department of Romance Language.

Finally, special thanks to University of Hawaii Sea Grant College Program Director Dr. Jack Davidson and his staff for their aid and assistance in organizing this project and cheerfully making countless changes in its structure and process as we went along.

This work is the result of research ("Analysis of Laws Applicable to Manganese Nodule Processing and Investment Climates in Representative Pacific Areas" project, PP/R-8) sponsored in part by the University of Hawaii Sea Grant College Program under Institutional Grant No. NA81AA-D-00070 from NOAA Office of Sea Grant, Department of Commerce. This is Sea Grant cooperative report UNIH-SEAGRANT-CR-85-02.

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I N T R O D U C T I O N

INTRODUCTION

I. The Purpose of the Study: Foreign Processing by U.S. Based Consortia Under the Deep Seabed Hard Mineral Resources Act

The discovery of strategic metals in the form of manganese nodules in deep seabed regions of the Pacific Ocean in the 1970's lead to the formation of international consortia to explore the commercial feasibility of "mining" such nodules and extracting the metal from the potato-sized rocks. Kent M. Keith, "Manganese Nodule Processing in Hawaii: An Environmental Prospectus," 14 Hawaii Bar J. 103 (1978) at 103-104. While the interest of the various consortia has waned considerably following the adoption of the Law of the Sea Convention at the Third United Nations Conference on the Law of the Sea in 1982 (UNCLOS III), Eldon H. Reiley, "Introduction to a Tempest: The Legal, Technological and Political Dimensions of the 1984 Law of the Sea Conference in San Francisco," 18 University of San Francisco L. Rev. 415 (1984); Tullio Treves, "The Adoption of the Law of the Sea Convention: Prospects for Seabed Mining," 7 Marine Policy (January 1983) 3; (and the international furor over its effect on "property rights" to minerals extracted from the deep seabed, see, e.g., D.R. Denman, Markets Under the Sea? 1984) which severely clouds private property rights and the ability of private parties to extract minerals from the deep seabed, nevertheless the United States Deep Seabed Hard Minerals Resources Act, 30 U.S.C. Secs. 1401 - 1473 (Supp. V 1981) contains provisions concerning the licensing of deep seabed mining applicable to all U.S. based consortia. See John Briscoe and Jo Lynn Lambert, "Seabed Mineral Discoveries Within National Jurisdiction and the Future of the Law of the Sea," 18 University of San Francisco Law Review 433 (1984). More specifically, Section 102(c)(5) settles upon the National Oceanic and Atmospheric Administration (NOAA) the responsibility to review applications for permits to undertake the processing of manganese nodules outside the United States (and presumably closer to known commercially-viable "fields" of deep-sea nodules) on the ground of economic necessity.

In order to evaluate these permit applications, and in particular to evaluate the legal and business climate in comparison to sites in the United States, it is necessary to have some notion of the range and kind of environmental and land use laws likely to be applied by selected potential host foreign countries to such a manganese nodule processing plant, as well as a series of economic/business factors. It is for this principal reason that the following study was undertaken, as well as to make some predictions concerning the universality of certain kinds of legal regimes in the Pacific Basin/Rim, based upon the six nations which forms the basis for this study.

While there is a substantial body of literature dealing with many aspects of mining manganese nodules from the deep seabed, including legal issues raised by such deep seabed mining following UNCLOS III and the convention which resulted from it, (A.M. Post, Deepsea Mining and the Law of the Sea, 1983; Manjula R. Shyam, Metals from the Seabed, 1982; Jon Van Dyke and Christopher Yuen, "'Common Heritage' v. 'Freedom of the High Seas': Which Governs the Seabed?" 19 San Diego L. Rev. 493 (1982); "The Status of Marine Mining," 18 Ocean Industry 44 (January 1983); "Deep Seabed Mining: A Comparative Study of US and West German Municipal Legislation," by David Caron, 5 Marine Policy 4 (January 1981); J.M. Broadus and Porter Hoagland III, "Conflict Resolution in the Assignment of Area Entitlements for Seabed Mining" 21 San Diego L. Rev. 541 (1984); John Briscoe and Jo Lynn Lambert, "Seabed Mineral Discoveries Within National Jurisdiction and the Future of the Law of the Sea," 18 U. San Francisco L. Rev. 433 (1984); Charles Biblowit, "Deep Seabed Mining: The United States and the United Nations Convention on the Law of the Sea," 58 St. John's L. Rev. 267 (1984); Dennis W. Arrow, "Seabeds, Sovereignty and Objective Regimes," 7 Fordham International L.J. 169 (1983-84)). (Moreover, several studies have addressed the regulation of major industrial facilities, most recently, Christopher J. Duerksen, Environmental Regulation of Industrial Plant Siting, The Conservation Foundation, 1983.) Little has been written on the subject of the land-based legal issues which confront a manganese nodule processor, and that which has been written deals primarily with U.S. law. Kent M. Keith, "Manganese Nodule Processing In Hawaii, An Environmental Prospectus," 14 Haw. Bar J. 103 (1978); Nossaman, Kruger & Marsh, An Analysis of Applicable Law Concerning Seabed Mineral Processing in California, Washington, Oregon and Alaska, 1980; Q. Dick Stephen-Hassard, et al, The Feasibility and Potential Impact of Manganese Nodule Processing in Hawaii, 1978; J.F. McGarry and Michael J. Brown, An Analysis of State and Federal Laws Applicable to Manganese Nodule Processing on the U.S. Gulf Coast, 1981. Less has been written about the potential land use, environmental and related legal and business climate issues in selected potential foreign sites for such a processing plant, despite the aforesaid wide interest by U.S. and foreign-based consortia in locating in various Pacific Basin and Rim countries. This study is designed to address these issues.

II. Methodology

A. Choosing the Countries

In the spring of 1983, Ray Jenkins and David Callies surveyed the literature on manganese nodules and from a list of approximately 50 countries, chose 12 with a relatively high likelihood of fulfilling the project's requirements for geographic and legal system diversity coupled with a realistic possibility of being a site for a manganese nodule processing plant based upon relative proximity to known seabed deposits and sufficient population, available (or relatively developable) port facilities and no known unwillingness to have such a plant, other things being equal. After several months' additional literature research and correspondence with officials in these 12 countries, we chose the following for intensive study: Australia, Canada, Colombia, Ecuador, Fiji and the Philippines. Aside from the obvious geographic diversity of these six, each represented a different legal system or variant on a legal system which, when taken together, would serve as an example for several countries in the Pacific Rim/Basin. Ecuador and Colombia represented centralized and Spanish-European systems with a democratic overlay. Fiji represented a reasonably developed Pacific Island system with both Pacific native and colonial aspects. The Philippines represented a more Asian Pacific national focus, while Australia and Canada represented loose federal, states-rights Anglo-American systems in highly developed nations. Geographically, the choices represented different parts of the Pacific Basin (Philippines, Fiji and Australia) as well as different parts of the Pacific Rim (Canada, Colombia, Ecuador) as well as different continents. Given the purposes of the study, Canada presented a particularly apt alternative to the United States given its obvious proximity and other similarities.

B. Methodology of Study

1. Part I Legal Analysis

For each country, we prepared thorough background memoranda based upon exhaustive literature searches and correspondence with the extensive help of law student research assistants in the summer of 1983. Based upon these memoranda and following additional correspondence with government and private sector officials in each country (and following a thorough briefing in Washington) we visited each country for approximately five days, collecting additional laws and reports of laws and interviewing pertinent government officials, private sector attorneys and experts, and members of the academic community with demonstrated expertise in the subjects of property rights, land use and environmental law. We were generally successful in finding one or more representative from each community of experts,

and conferred with approximately a dozen experts in each country. They are listed, together with their official titles and areas of expertise, in the appendix to this report, together with the primary and secondary materials we surveyed in preparation of this report.

Upon completing our conferences and surveys (which extended from late 1983 through the third quarter of 1984), with the help of law student assistants we integrated our findings and additional materials into our existing case study memoranda and reduced them to what we conceived to be manageable proportions during the last part of 1984. We then transmitted such revised and condensed case studies to roughly a dozen experts in each of the six countries for their evaluation while we prepared a review draft for comment and presentation to NOAA in February of 1985. This study reflects the results of that expert review together with the comments and suggestions resulting from our substantive briefing of NOAA officials and consortia representatives in Washington on February 19, 1985, together with comments on our review draft.

2. Part II

The goal of Part II of this study is to provide an applied framework for examining the economic and business investment climates in countries being considered as sites for a manganese nodule processing plant. Six representative Pacific countries were examined to illustrate the range of factors that need to be considered in completing a study of the economic and investment climates in different countries.

Part II is divided into two main sections. The first section summarizes the main elements, with each element compared across the six countries. These elements included a comparison of: (1) foreign investment attitudes, (2) country economic risk, (3) political risk, and project risk. Project risk comparisons are further subdivided into the following six elements: (i) capital costs, (ii) transportation costs, (iii) energy costs, (iv) labor costs, (v) tax levels, and (vi) port suitability.

The second section of the report contains a more detailed analysis of each country including: (1) policies toward mining and processing, (2) policies toward a manganese nodule processing plant, (3) characteristics of each country's minerals sector, (4) industry views toward investment, (5) labor costs, (6) energy costs, (7) inflation and exchange rates, (8) taxation and incentives, and (9) the physical environment of ports.

C. Parameters and Limitations

The property, land use and environmental laws discussed in each of the following six case studies are accurate and complete to the best of our knowledge through the beginning of 1984. While there will be some updating based upon review comments, the results will not necessarily be uniform. In particular, we have had little contact with or response from Fiji on our legal analysis since December of 1983. Moreover, despite an attempt at reasonable uniformity in order to facilitate comparison and conclusions, we found that it was impossible to treat all countries equally since some had clearly devoted more resources to land use planning and/or environmental protection (Canada, Australia) than others (Ecuador, Colombia) over the years. Moreover, while we do not believe it affects either the basis of our understanding or the accuracy of our analysis, we were somewhat hampered in Ecuador and Colombia by our relatively poor command of Spanish despite some reading and conversational skills which one of us was able to utilize. While the services of a translator in Hawaii was of inestimable aid and importance in translating key laws and portions of laws, and while the aid and assistance of bilingual attorneys and officials in both countries contributed to our ability to do research, nevertheless our ability to deal effectively with detail was undoubtedly hampered.

III. Manganese Nodules and Their Processing: Our Assumption*

Manganese nodules are a unique raw ore that will be delivered to the processing site by ocean transport direct from the mining site. Nodule exploitation will not deplete the host countries' mineral resources except for those used as process materials or energy generation. An existing or prospective port site should be available with a potential draft of 12.2 m and sufficient space to handle 60,000 DWT or larger ore carriers. Water frontage area will be required for a pier with off-loading equipment, a surge storage area, bunkering and ship service facilities.

The plant site does not have to be immediately adjacent to the port, but should be close enough to permit economical transport of raw materials and the use of common service group for the port and plant. Containerized process materials and supplies may be received at this port or an existing facility and products may be exported in the same manner. Personnel to operate the facility would preferably come from existing communities. A townsite would

*This section is an edited version of materials prepared by Ray Jenkins in 1983.

be provided if required. The following narrative outlines more fully the specific parameters of site and infrastructure requirements, but basically:

- The reductant and energy requirements of the plant and port would be furnished by imported coal. Power would be generated internally using waste heat augmented by a coal-fired steam plant. Locally available coal and/or electric energy would be a desirable alternative.
- Acids and gases used in large quantities would be generated on-site unless available locally. Lime would be burned on-site if not available locally.
- Bulk process materials such as sulfur, limestone, iron ore and silica not available locally would be imported as dry-bulk cargoes. Locally procured materials would be delivered to the plant site by rail, truck, or barge.
- Containerized or palletized material, either inbound or outbound, would preferably be handled through existing harbor facilities.
- Stockpile areas for a two-month supply of nodules and a one-month supply of bulk raw materials would be located at the plant site. Additional area would be provided for an appropriate stock of the lesser volume process materials. Bucket wheel stacker-reclaimers would be used for stockpile material handling.
- Nodule characteristics and throughput rates have varied significantly in the several studies which have been published. The nodule characteristics for this study follow the latest USBM studies:

<u>Value metal content of dry nodules</u>	<u>Mean of Clarion- Clipperton Zone</u>	<u>Value Used</u>
Nickel	1.28	1.35
Copper	1.02	1.1
Cobalt	.24	0.25
Manganese	25.4	27.0

- Nodules process rejects or tailings, both liquid and solid phases, are assumed to be within U.S. Environmental Protection Agency (EPA) limits for nonhazardous waste. Other waste products such as ash

and water treatment sludges, etc., are similar to industrial wastes whose treatment is well established. Gaseous emissions will be cleaned to conform to clean air standards of the EPA.

- The mine site selected for this study corresponds to Deep Ocean Mining Environmental Study (DOMES) Site B at 12 degrees N, 138 degrees W. This is the approximate center of the area of maximum economic interest within the Clarion-Clipperton Fracture Zone.

A. Nodule Mining and Transportation

The principal material would be raw nodules, as mined and drained, delivered by modified ore carriers shuttling between the mine site and the processing port. The mining ships would transfer the nodules to the transports through a slurry system.

The transports would be unloaded by either jet-slurry pumps or clamshell unloaders.

The number of transports required will be determined by a "redundancy factor" and the distance from minesite to port. Table 2 shows the calculated number of transports required from various home ports to the Domes Site B mine site.

The transport economics are influenced by the number of transports, the tonne-nautical miles hauled, and the capital and operating costs of the vessels.

B. Marine Terminal Scenarios

Two basic scenarios have been considered in publishing studies depending on the assumed availability of plant sites and their proximity to a port with 12.2 m draft. NOAA studies have assumed that plant sites on the Pacific or Gulf coasts would be 40 to 100 km from the port. CANMET studies of British Columbia have nominated plant sites within 2 to 12 km of the unloading docks. Studies for the State of Hawaii have considered plant sites from 3 to 16 km from the port.

Three options are available for internal transport of nodules from the port to plant site; rail, slurry pipeline, and conveyor. Single flight, straight and curved conveyors of up to 15 km are fairly common. Rail lines and slurry pipelines can be any reasonable length. Practically, the cost of internal transport adds nothing to the value of the product and if excessive, would make a site economically noncompetitive.

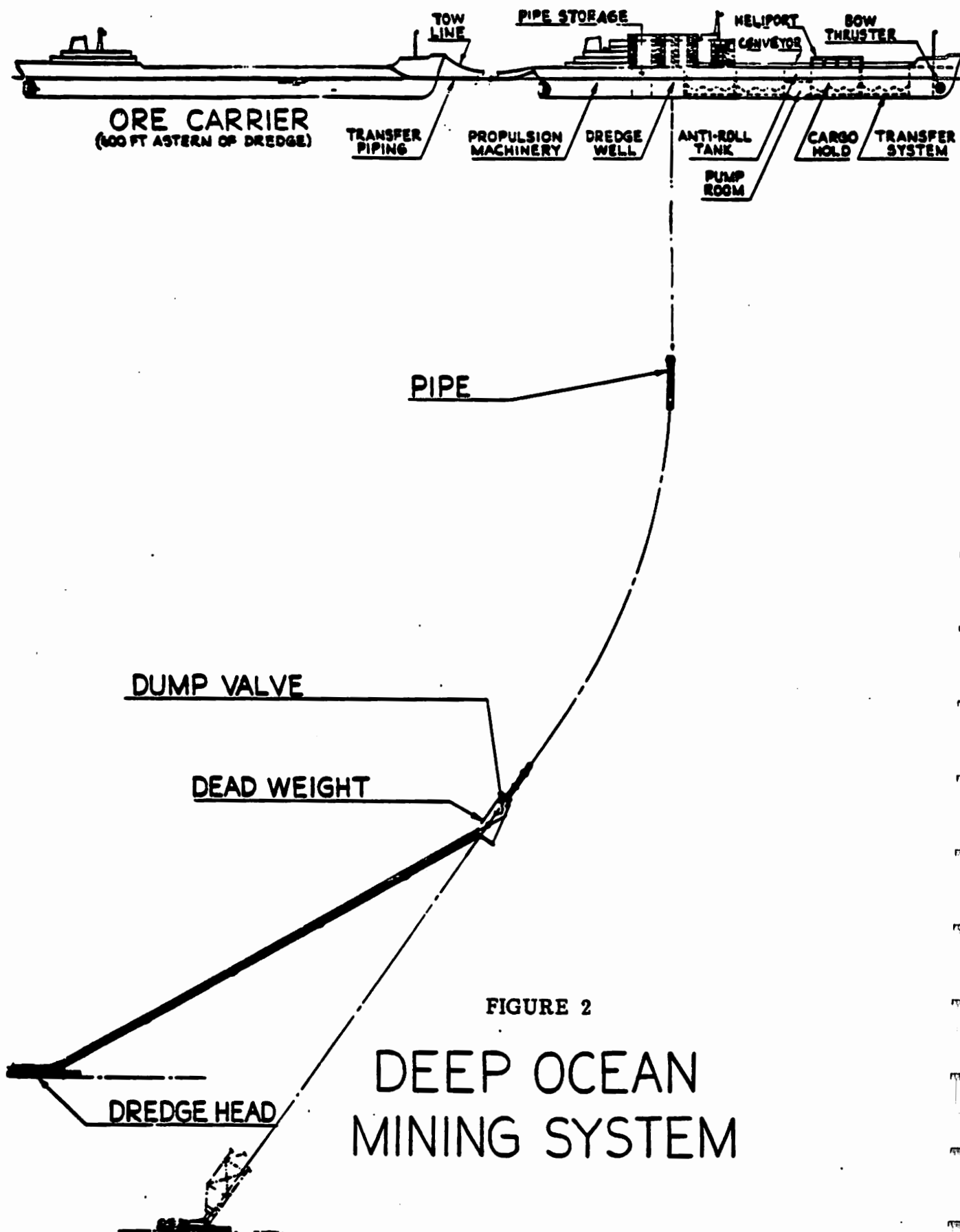


FIGURE 2

DEEP OCEAN MINING SYSTEM

TABLE 2
NODULE TRANSPORT FROM VARIOUS PORT SITES

<u>PORTS</u>	<u>Nm</u>	<u>Days Roundtrip</u>	<u>Roundtrips/ y</u>
Hilo, Hawaii - US	1100	8.4	39.0
Southern California, US	1750	11.7	28.1
Pacific Northwest, US	2275.	14.5	22.8
Prince Rupert, Canada	2500	15.6	21.1
Manzanillo, Mexico	2200	14.0	23.4
Panama	3680	21.8	15.1
Gulf Coast, US	4935	28.3	11.6
Barranquilla, Colombia	3800	22.4	14.7
Buenaventura, Colombia	3750	22.1	14.9
Callao, Peru	3860	22.7	14.5
Valpariso, Chile	4600	26.5	12.4
Queensland, Australia	4300	25.0	13.2
Manila, Philippines	5800	32.8	10.1
Tokyo, Japan	4600	26.6	12.4

The dry-bulk handling system is a more typical method of handling ore cargoes. This system would unload nodule cargoes as well as coal, coke, limestone and other ocean-delivered bulk process materials. Locally produced bulk process materials delivered by barge can also be unloaded and transferred to the plant site. The unloading is accomplished by two or more clamshell units, rail-mounted on the pier and discharging through built-in hopper-feeders to a dock conveyor as shown in Figure 4.

Additional facilities at the marine terminal will depend on available port infrastructure for handling containerized imported process materials and supplies, and exporting metal products which will be palletized or containerized. In order to obtain a fast turnaround for the nodule transports, the port should provide bunkering and provisioning services along with essential warehouses and shops. Material in transit will require both paved and covered storage space. A port office and amenities for the work force will also be required.

The marine terminal could also be the loading site for ocean disposal of wastes delivered by pipeline from the plant.

C. Internal Transport and Material Handling Scenarios

It would be most desirable to locate the processing plant site immediately adjacent to the marine terminal. Port sites adequate for industrial support are generally limited in most countries and the development authorities are reluctant to use waterfront areas for anything other than port traffic. With this constraint in mind, our model assumes that the distance from the port fence to the plant gate will be at most 5 km.

A transport corridor between the port and plant would include the nodule transport system, a service road, pipelines, and power and communication lines. An ancillary transport system for delivery of products to the port may be included in the corridor.

The slurry transport concept is shown in Figure 3.

The dry-bulk system is shown in Figure 4. Dust control is accomplished by the use of covered conveyors, dust collectors at intersections and other source points, water sprays at active areas, and sealing sprays on less active piles. Leachate and drainage from the piles will be collected, settled, and recycled.

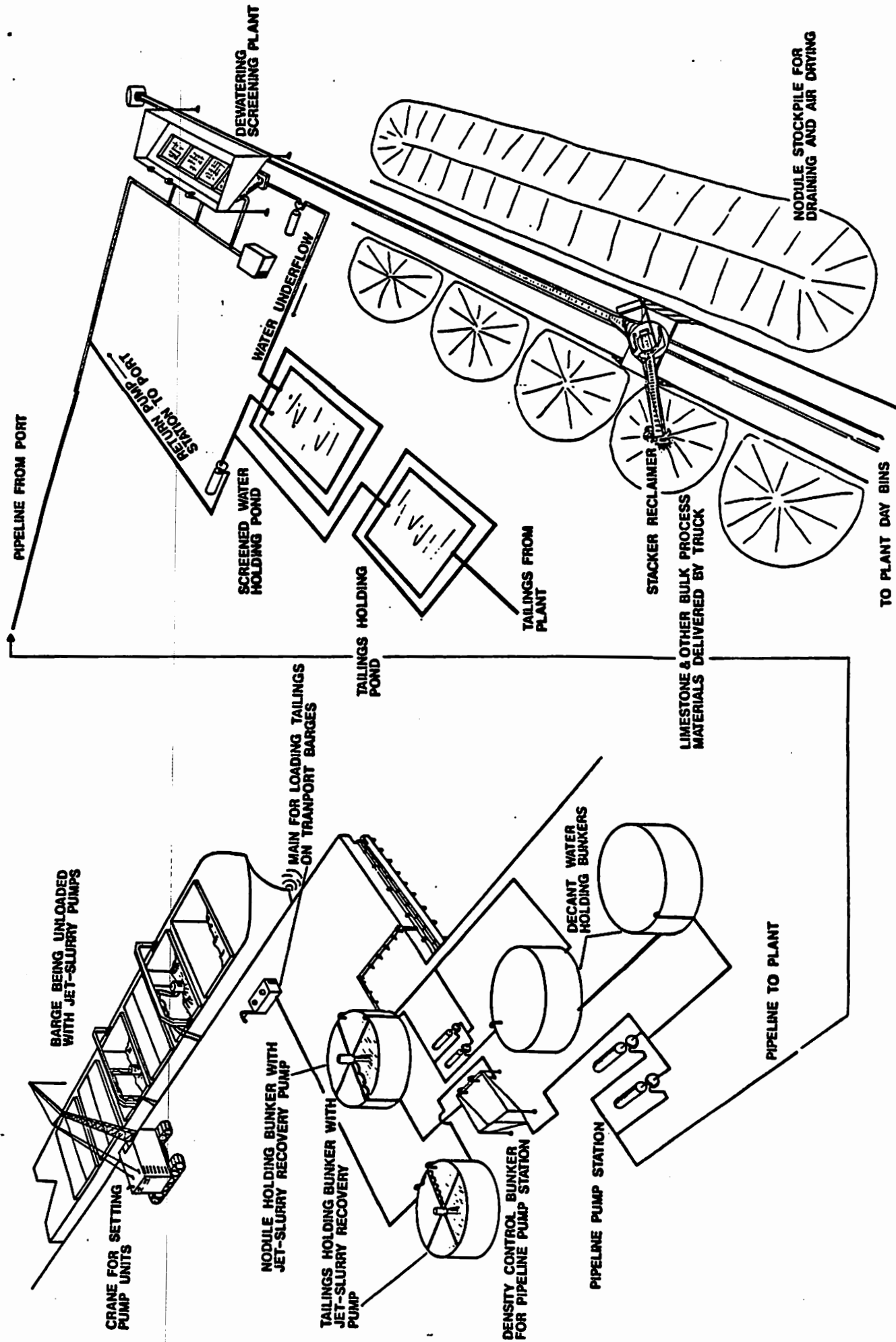


FIGURE 3

SLURRY SCHEMATIC

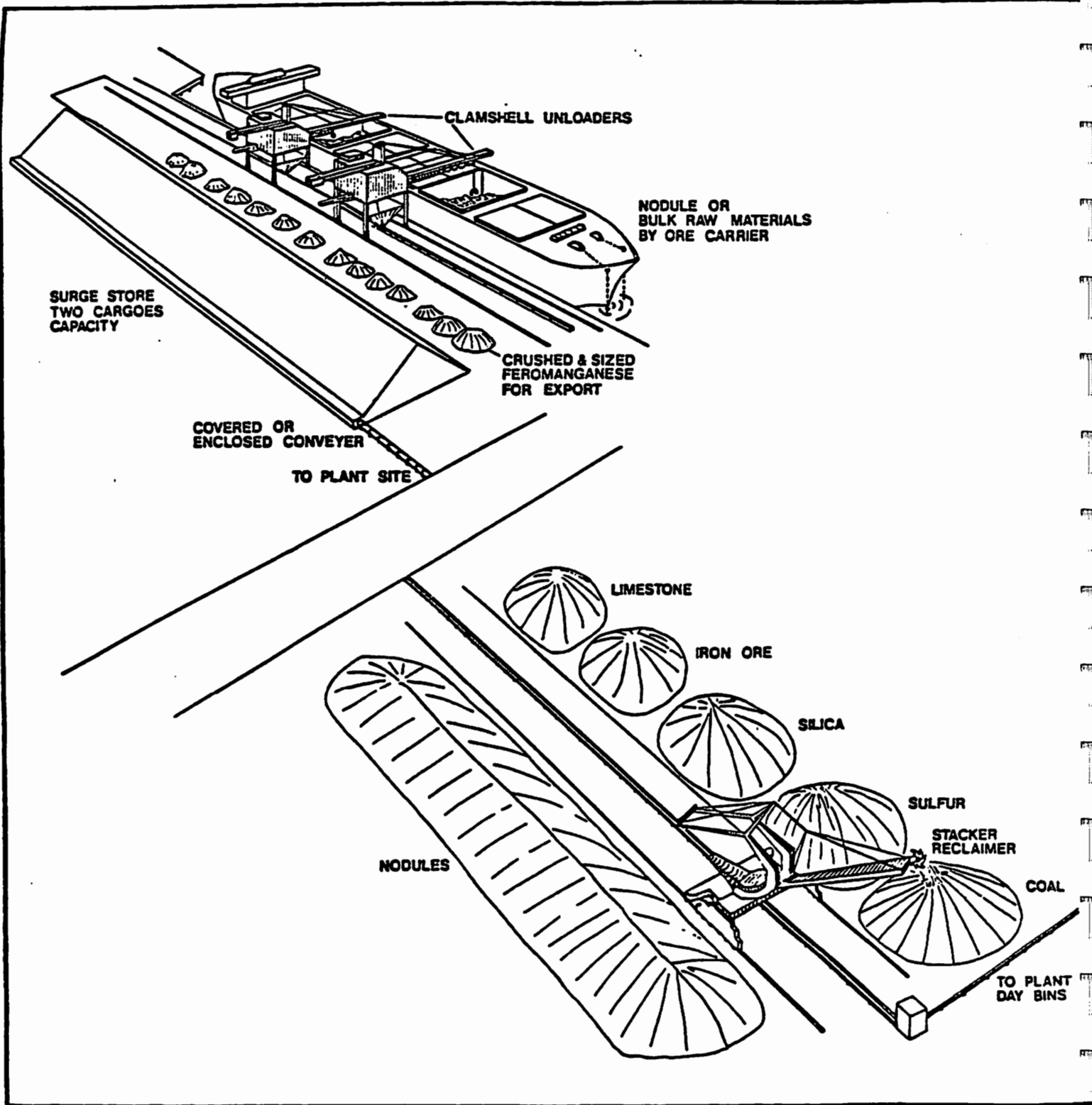


FIGURE 4

DRY BULK SCHEMATIC

D. Processing Plant Scenarios

The processing plant scenarios used in this study are based on inferred processing schemes or flow sheets. To convert these abstract flow sheets into useful inputs for siting considerations, it is necessary to synthesize a model for each process. Known procedures and equipment applications are assigned to the various process steps. The models thus constructed are useful tools for projecting site requirements and impacts.

In this section of the report, the two phases of the synthesizing method are covered: process flow sheet descriptions based on USBM studies; and, descriptions of process equipment and operations derived principally from NOAA studies, CANMET, Black, and others.

1. Cuprion Ammoniacal Leach Process

The Cuprion process is a three-metal process in which copper, nickel, and cobalt are liberated in an ammonia-ammonium carbonate leach following a reduction-leach step. Carbon monoxide is used to regenerate the cuprous ion which reduces the manganese dioxide. The physical characteristics of nodule tailings from the Cuprion ammoniacal leach process would be similar to the tailings generated in nickel laterite processing by the Caron process. These wastes from laterite processing have been known to settle to relatively high densities and become a mechanically stable waste. The major difference between the laterite tailings and manganese nodule tailings would be the relative iron and manganese contents. Laterite tailings are high in iron and low in manganese, while nodule tailings would be of an opposite composition. This, however, would have little effect on the physical parameters of the respective tailings. Typical physical characteristics of these tailings would be a particle size of minus 200 mesh, settling densities of 50-60 percent, and good long-term stability.

Chemical characteristics of the Cuprion tailings is similar to that of tailings from nickel laterite processing by the Caron process except for a higher manganese and lower iron content.

2. High Temperature and Pressure Sulfuric Acid Leach Process (Figure 6)

The high temperature and pressure sulfuric acid leach process is a three-metal process in which copper, nickel, and cobalt are selectively leached from the nodules from strong sulfuric acid at high temperature and pressure. The physical characteristics of the nodule tailings from the high temperature and pressure sulfuric acid leach process would be similar to the tailings generated in nickel laterite processing by the Moa Bay, Cuba, method. These wastes have been known to settle to relatively high densities and become mechanically stable. The major differences in the laterite tailings and the nodule reject waste material would be the iron and manganese content, with laterite having high iron and low manganese, and nodules the converse composition. This should have little effect on the physical properties. Typical physical characteristics of the tailings would be a particle size of minus 200 mesh, settling density of 50-60 percent, and good, long-term stability.

Chemical characteristics of these nodule tailings would be similar to those of tailings from laterite processing at Moa Bay, Cuba, and would have a higher manganese and lower iron content. By far the major constituent present in this waste would be manganese as manganese dioxide or oxide. The second major constituent would be iron hydroxide. These two elements and their compounds would account for over 80 percent of the tailing composition. The principal anion forms would be hydroxide, oxide, and sulfate. The majority would be oxide, followed by hydroxide, then sulfate.

3. Smelting and Sulfuric Acid Leach Process

The nodule smelting process is a combination pyrometallurgical and hydrometallurgical treatment of nodules to recover the value metals, nickel, copper, and cobalt, with the option of recovering ferromanganese or a storable by-product of manganese and iron. The smelting process produces a slag, from which ferromanganese is recovered, and a value-metal alloy matte composed primarily of nickel, copper, cobalt, and sulfur. The matte is granulated, slurried, and selectively leached with sulfuric acid at elevated temperature and pressure.

The physical characteristics of the nodule slags and tailings from the smelting and sulfuric acid leach process would be similar to wastes generated by land-based nonferrous smelters. These wastes are generally large, inert, glassy materials that contain the elements sealed in an impermeable glass matrix. These slags are used for fill material and roadbeds among other uses. The physical parameters of nodule smelting slags would be similar to the above description with particle sizes generally greater than 10 mesh, excellent settling densities, and excellent long-term stability.

The chemical characteristics of nodule slags and tailings will be similar to slags and tailings produced by nonferrous smelting processes. Table 3 lists the 14 elements of interest, their estimated concentrations, and the possible compound forms that may be present.

The major constituents of this material would be silicate glass and iron. The residues would also contain trace levels of metal sulfides not leached during processing. Most elements present will exist in the metallic state or as oxides with only a small amount of sulfides present.

E. Support Services and Facilities

Project management which will include financial, procurement, personnel and community relations will be located on the plant site in an administration building. An employee amenity building will include change rooms, dispensary, meeting and training facilities as well as some recreational features.

Maintenance support will require mobile equipment shops, machine and electrical shops and working areas for the different crafts. Warehouses and storage yards will also be required. A combined laboratory and engineering office building will be required for technical control. The plant operating staff will also be located in this building.

Yard services will include the maintenance of roads, external pipelines, conveyors and power lines. This group will also handle expansion of the waste disposal area, day-to-day construction and general housekeeping around the operation.

The total outlay for support services and facilities depends on the availability of support from external sources. It is accepted industry practice to utilize independent suppliers of services to the greatest extent consistent with an efficient operation. Sources of purchased power, water supplies, processed gases, reagents and materials in reasonable proximity to the operation would greatly reduce the outlay in capital and manpower resources and provide an opportunity to integrate with the local community. Locally available manufacturing and shop services would be of great benefit to a processing complex.

Power over and above that generated by waste heat utilization would be purchased if available.

Cuprion Process	10 MW
High Temperature Sulfuric Acid Process	95 MW
Pyrometallurgical Process	275 MW

TABLE 3

Predicted Composition of Manganese Nodule Tailings
from the Cuprion Ammoniacal Leach Process

Element	Remaining in Tailings, pct	Estimated Concentration Range, wt-pct	Probable Compounds Present
Antimony	~ 90	0.002-0.004	Iron or manganese antimonide
Arsenic	~ 90	0.003-0.010	Iron or manganese arsenate
Barium	~ 100	0.150-0.300	BaSO ₄
Cadmium	~ 10	0.0001-0.0010	CdCO ₃ Cd(OH) ₂
Chromium	~ 90	0.001-0.002	Cr ₂ O ₃ Cr(OH) ₃
Cobalt	~ 30	0.05-0.15	Co(OH) ₂ CoCO ₃
Copper	~ 10	0.05-0.15	Cu(OH) ₂ CuCO ₃
Iron	~ 100	6.0-10.0	Fe(OH) ₃ FeCO ₃ Fe(OH) ₂ FeO·OH
Lead	~ 90	0.02-0.05	PbCO ₃ Pb(OH) ₂
Manganese	~ 100	25-35	MnCO ₃ Mn(OH) ₂ MnO ₂ MnO Mn(OH) ₂
Nickel	~ 10	0.15-0.30	Ni(OH) ₂
Selenium	~ 90	0.0025-0.0075	Iron or manganese selenate
Thallium	~ 70	0.01-0.02	Tl(OH) ₃
Zinc	~ 60	0.075-0.125	Zn(OH) ₂

Water requirements are 7.6 Mm /y based on some recycling. The water quality does not have to be potable, but should be amenable to treatment.

F. Plant Description

The plant and its main auxiliaries will operate on a 365 day, three shift basis. Offices, shops, laboratories, and other support activities will function on a single shift, five-day week basis, with some minor exceptions.

Most plant operations will be housed in separate, one to three-story structures. Stockpiling, ore preparation, drying, granulation, thickening tanks, baghouses and electrostatic precipitators will be in outside structures. Stacks for waste heat, power plant, and cleaned gas emissions will be over 100 m in height.

Sufficient setback would be provided to screen the plant area with landscaping. Noise attenuation would be accomplished with enclosures and silencers. Noise levels at the plant fence will range from 50 to 65 dbA. This is about the same level of sound as is heard near a freeway.

Gaseous emissions will be cleaned before release to the atmosphere as described in the process narratives. Fugitive dust will be controlled by spraying and surface cover. Tailings disposal areas would be vegetated and landscaped.

The land requirements are somewhat different for each process. The following tabulation gives the approximate areas, assuming ocean delivery of all materials, full stockpiling on site, a five km transport corridor between the port and plant, and land-based tailings disposal:

<u>Item</u>	<u>Hydrometallurgical Processes</u>	<u>Pyrometallurgical Processes</u>
Marine Terminal	15 ha	15 ha
Transport Corridor	25 ha	25 ha
Plant Site		
Dry-bulk stockpile area	35 ha	40 ha
Roads, access & material storage areas	25 ha	25 ha
Leach and wash sector	100 ha	
Refining & cobalt recovery	50 ha	
Drying and reduction		10 ha
Smelting, matte & manganese		100 ha
Refining & cobalt recovery		50 ha
Auxiliary facilities	25 ha	40 ha
Subtotal plant site	235 ha	265 ha
Tailings disposal		
at 8 ha per year, 20 years	160 ha	
at 6 ha per year, 20 years		140 ha
Total	435 ha	445 ha

The main plant area should be located on reasonably flat land with suitable soil conditions to provide drainage and suitable foundation for the structure loadings required. Environmentally the site should be located away from residential or commercial districts so that the plant can be screened from travelled thoroughfares. The site should not be located on present or planned historic, cultural or park areas.

Because of the many restraints to development, ideal locations are seldom available and plants are often located in sites with less than ideal conditions with a resultant economic impact. As previously stated, reasonable proximity to the marine terminal and waste disposal areas are also important considerations.

G. Tailings Disposal

Existing mineral operations in the Pacific Rim countries use nearly every known technique of tailings disposal except ocean dumping. Disposal of tailings in slurry form by offshore pipelines are used in Canada and the Philippines. Offshore pipeline disposal of decant tailing water is used in Australia. Numerous land-based disposal tailings dams and ponds are in use in tropical locations with high rainfall and arid deserts with minimal rainfall. Milling processes are used that yield coarse tailings that can be used for dam enlargement, and fine tailings in the 250 x 70 micron range. Pacific Rim countries are familiar with the problems of structural stability of tailings impoundments, subjected to seismic shock.

The Avondale group has completed the nodule and reject characterization studies for the gas reduction/ammoniacal leach and the Cuprion processes. Results to date indicate that the tailings are benign and nonhazardous. The process descriptions included the predicted chemical and physical characterization of the nodule tailings. Other waste streams usually categorized as industrial wastes such as power house ash, water treatment sludges, lime boil and flue gas treatment sludges, will probably be added to the reject of slag waste streams for disposal. It is not likely that these streams, which are typical of industrial processes, would seriously degrade the overall waste streams.

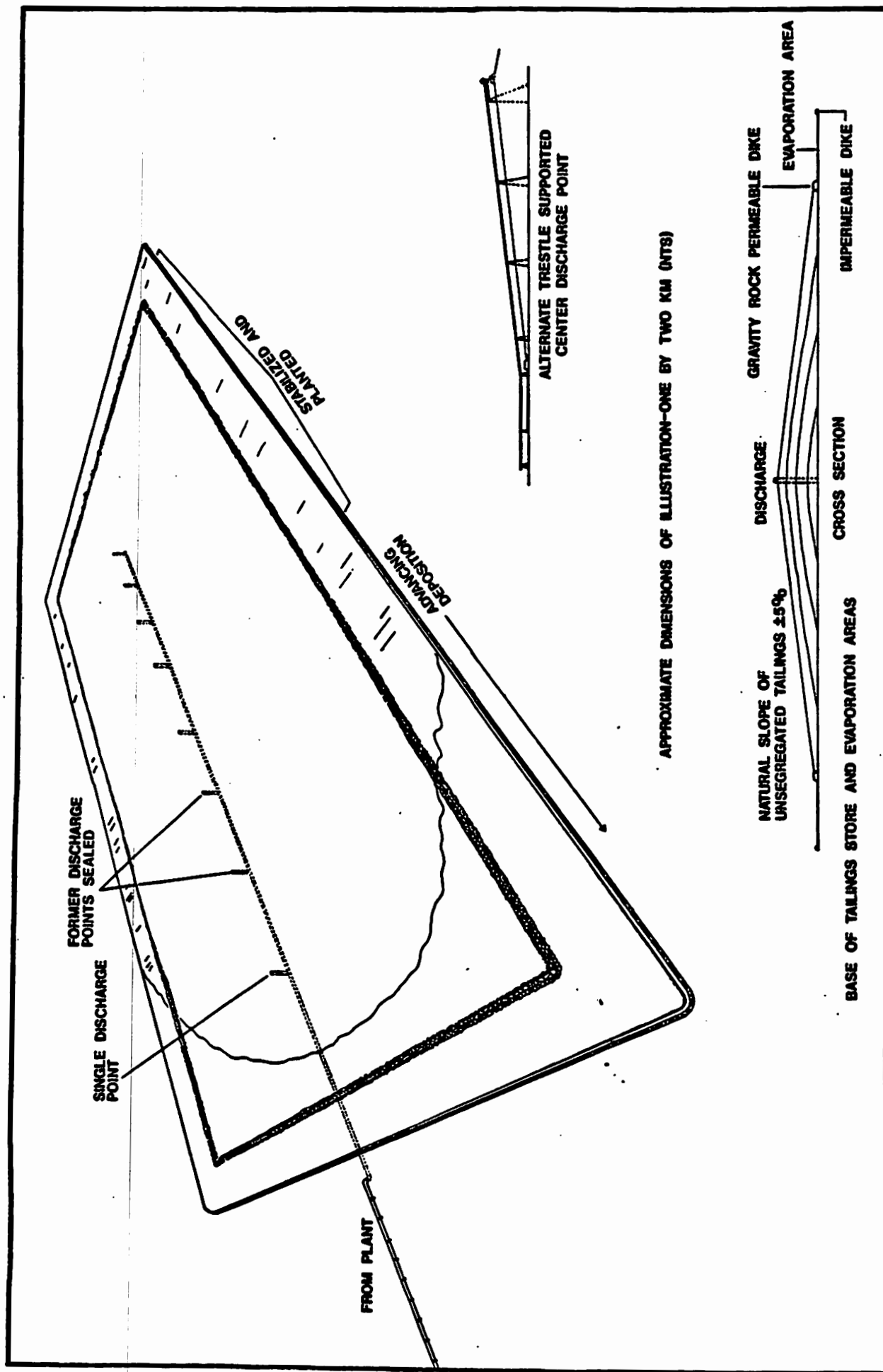


FIGURE 11

THICKENED DISCHARGE TAILINGS DISPOSAL

Disposal of hydrometallurgical process nodule tailings on land requires an impoundment area of approximately 8 ha per year. The silt-like tailings, with a minor clay component, are not suitable for construction of the impounding structures as deposited from a slurry. These structures will have to be constructed from local earth and rock. Figure 11 shows an impoundment areas in which the silt tailings are deposited on a natural slope without segregation. The tailings drain to a low area where the fluid can be evaporated, dispersed through seepage, or recycled to the plant. Depending on the nature of the soil and subgrade, groundwater quality, and bedrock porosity, the disposal area can be sealed with a clay or other impervious layer before use. The impoundment area is laid out so that it can be progressively revegetated as it is filled.

A second type of disposal area consists of a totally enclosed, diked and lined area equipped for decantation of the slurry water for evaporation in a separate pond, or reuse. The tailings consolidate and are revegetated when the pond is filled.

Disposal of granulated slags and the attendant waste streams from pyrometallurgical processes will require less area, about 7 ha per year. These tailings would have greater structural strength, but might require topsoil before revegetating.

Constructive uses of tailings for landfill and resoiling additives are under investigation. Since tailings are readily transported as slurry, it is not necessary that the tailings disposal area be adjacent to the plant site or that it be concentrated in a single disposal site.

In the preceding sections covering material handling and processing, mention has been made of the various procedures to recover and recycle fumes and dust and to impound drainage and leachates from the plant areas. Given today's techniques for mitigation of environmental impacts, there is no reason why a properly sited plant cannot be a good neighbor.

IV. Summary of Conclusions

The survey and analysis of the land, land use and environmental laws of Australia, Canada, Colombia, Ecuador, Fiji and the Philippines isolates several legal trends which should be useful in considering an application from a U.S.-based consortium to process manganese nodules outside the United States. Although it is difficult to quantify them, each will involve costs in terms of time and paperwork as well as provision of infrastructure to support the considerable power and port facilities needs for such a plant. Moreover, the trend is clearly toward more, rather than less, regulation of development. Given the clear and unavoidable

effect such laws and regulations will have on the timing and costs of developing a processing plant, we were surprised at the relatively little "risk analysis" available on effects of such heavy legal constraints.

While, as appears below, some countries have an expedited and all-encompassing "one-stop" process for large projects such as a processing plant, there is little indication this will result in any bending of applicable laws and regulations, or lessening of the need to make contributions for additional infrastructure where needed. On the other hand, virtually every country favored the location of such a plant somewhere on a coastal area, and each had one or more sites theoretically available, though several have severe facilities and infrastructure limitations which may well prove insurmountable in the short run.

A. Prevalence of Environmental Impact Requirements

Virtually every country studied has a scheme for requiring an environmental impact assessment by any party proposing something as massive as a nodules processing plant. Such a requirement may be statutory or executory (decree, order-in-council). It is often "informational" only; that is, an assessment disclosing adverse environmental consequences rarely triggers a denial of permission to proceed in and of itself. However, the information provided by such an assessment generally goes by law to the heads of departments charged with granting or denying other needed permits or licenses for such a processing plant, and the adverse environmental findings, if any, resulting from such an environmental impact assessment, is usually grounds for denial of such permits and licenses.

B. Prevalence of Substantive Environmental Laws

Virtually every country has a substantive code for air and water pollution control, usually complete with emission or effluent standards for certain pollutants, or is in the process of completing one. These can be expected to apply to particulate emissions from a processing plant, as well as to wastewater and tailings disposal into the marine environment. In addition, half the countries studied have substantive ocean dumping provisions, though these are sometimes contained in legislation with other primary purposes (e.g., Canadian fisheries protection laws).

C. Prevalence of National Plans

Most of the countries studied have national plans, primarily dealing with economic development, which affect the locating of a processing plant if the applicant is a foreign investor. These matters are treated more fully in the economic/business climate aspects of our report. In addition,

some of these plans have particular land use provisions, but are generally so broad as to be inapplicable for purposes of land use planning and control. However, in at least two countries, initial application for approval to construct such a plant must commence in the national or state/provincial office charged with administering a national or regional plan.

D. Local Planning and Zoning

While most of the countries studied provided for relatively detailed land use controls at the local government level, such controls in nearly every case are restricted to urban areas or jurisdictions in which it is extremely unlikely a processing plant would be located for reasons, inter alia, of lack of available space. Moreover, even where such local controls such as zoning and development codes were applicable, the state/province or national government had authority to override local controls for a project such as a manganese nodule processing plant. This is in sharp contrast to the situation throughout most of the United States where denial of development permission under local zoning, subdivision or development codes is generally final unless appealed to the courts.

E. Project-Specific Development Agreement Laws or Processes

One of the more fascinating findings in two of the countries surveyed is the detailed framework for processing an application for a large development for such as a nodules processing plant wholly apart and separate from regular land use and environmental law systems. Indeed, in Queensland, Australia, there are two such processes by which long and detailed government/developer agreements are formally approved by the state legislature and govern the construction and operation of the project in its entirety. Once again, this is contrary to the experience in most of the United States, where such developer or annexation agreements, where they exist at all, generally do so without benefit of formal legal sanction except in the states of California and Illinois, though other states like Hawaii are formally considering enabling legislation for such agreements in the form of bills before the state legislature.

While such provisions have the capacity for expediting the permit process, and tailoring the permit to fit the project more precisely than generally enacted and generally applied land use and environmental codes and regulations, they often serve as a vehicle for extracting extraordinary concessions from a developer beyond what could be obtained through regular processes.

F. Umbrella Agencies

Several countries have established umbrella agencies to guide major projects through the permitting process for development. While these tend often to be national planning agencies (Canada, Colombia) there may be a trend toward lodging such authority in natural resource-sensitive agencies as well (Colombia). As with the development agreements described in the preceding subsection, these agencies have the potential for expediting the permitting process which is likely to be of particular importance to a foreign consortium seeking to do business involving land development in an unfamiliar legal and institutional system. On the other hand, to the extent that such an agency has authority to veto a project (and not all do) it increases the risk of development permit disapproval if one such agency becomes disenchanted with a proposed development.

G. Natural Area or Natural Resource Protection Agencies and Laws

Four of the countries studied have natural resource protection laws and agencies which can be expected to exercise some control over the manner in which a processing plant is carved out of a new, rather than an existing, port/harbor area. Special permits are often required to develop such a processing plant in or near special reserves, or where specific resources would be damaged or destroyed.

H. Port Facilities Regulation

Every country surveyed has statutory provisions governing the use of existing port facilities, generally lodged with a port authority. While most of the subjects regulated have to do with navigation and cargo, each has something to say about the regulation of new construction, at least of piers and docks, and sometimes of other foreshore facilities as well. However, only two of the countries surveyed have such construction regulations applicable to new as well as existing ports. This may mean that this legal regime has little direct applicability to a processing plant because there is virtually no room in most developed ports in most of the countries surveyed for a project with the land area needs of a manganese nodules processing plant.

I. Military Controls

In four of the six countries surveyed, it is clear that the coastal areas are within the jurisdiction of a military agency for defense purposes, and their permission, often express, is necessary before a processing plant may be built. The most institutionalized example of such military control appears to be in Colombia in the form of the agency DIMAR.

J. Mining Laws

In all but one of the countries surveyed, there is general agreement that national mining laws would be inapplicable to a processing plant using raw materials from outside the host country. This is particularly significant because specific regulations applicable to the kind of plant construction and processing contemplated for manganese nodules are found in nearly all of the countries surveyed - but in the mining codes. Unless and until they are amended, these specific regulations will therefore likely be inapplicable to a manganese nodule processing plant which processes nodules from the deep seabed areas. Note that there is a good argument to be made for applying these laws if the plants are instead processing manganese crusts from continental shelves and other areas claimed as territory by the host country.

K. Native Property Rights

In one country surveyed, over 80 percent of the available land is held by indigenous natives in a tribal hierarchy. While the existing national government is largely made up of their representatives, and while that government has created by statute and agency with power to convey leasehold interests in that land to foreigners for the purpose of mining and development, it is not altogether clear how enforceable these rights may be, especially if the control of the government should shift. This situation probably exists in a number of Pacific Basin island states.

A final note: We have found that many countries have inserted critical land use and environmental assessment or regulatory provisions applicable to such as a manganese nodule processing plant into older laws whose titles often bely their contents. An outstanding example is the Canadian fisheries laws which contain detailed provisions with regard to waste discharge in order to protect the marine environment. A cursory survey of national environmental and land use laws will rarely disclose these provisions, and close contact with knowledgeable governmental officials and practicing attorneys is therefore critical in accurately gauging the level and scope of regulation applicable to such a plant.

P A R T I

SURVEY OF LAND AND ENVIRONMENTAL LAWS

A U S T R A L I A

A U S T R A L I A

I. Substantive Introduction

A. Scope/Conclusion

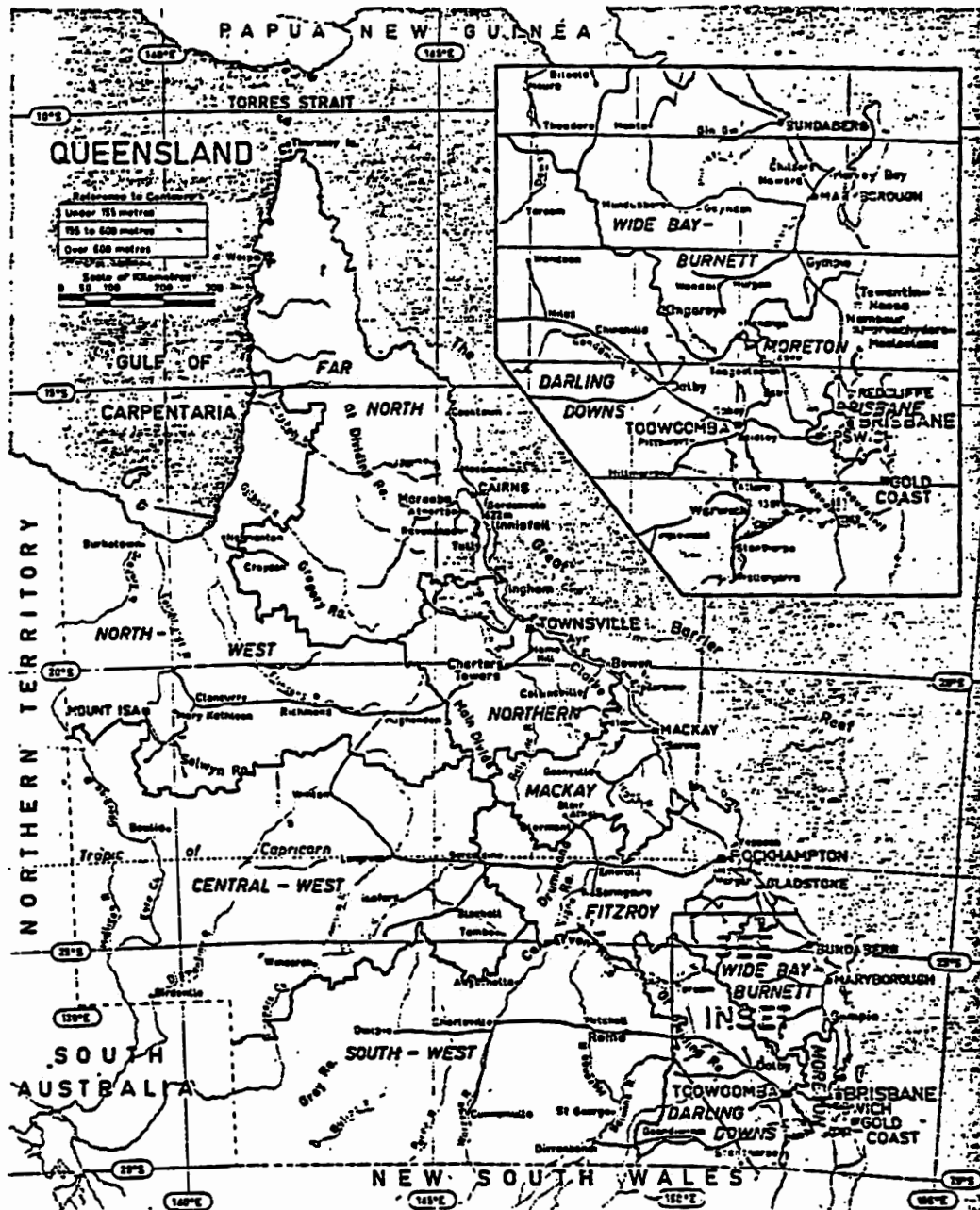
With the reelection of Sir Johannes Bjelke-Petersen as Queensland State Premier, Queensland retains its reputation as the most pro-development state in Australia. Under the circumstances, Gladstone, a port city with a lot of existing mineral industry to the north, continues to be a prime site for the siting of a manganese nodule processing plant. Indeed, in the fall of 1981, a U.S. consortium made just such a proposal to the Queensland government's Department of Commercial and Industrial Development after what looks like a fair amount of preliminary investigation. The consortium, Ocean Mining Associates, which also had two European members, broke off negotiations that same year. Basically, the Queensland government, through its unique office of the Co-ordinator-General (which reports directly to the Premier) has effective power under two legally powerful alternatives to normal land regulation and permitting procedures, to expedite and permit major commercial developments in Queensland, and has already done so many times over the past ten years. The only effective "opposition" could come from the Commonwealth (federal) government in Canberra which can delay and embarrass the Queensland government in the granting of such permits under the Commonwealth's environment protection law (potentially leading to an environmental impact statement), possibly require a permit for the ocean discharge of tailings under the Great Barrier Reef Protection Act (the Commonwealth has designated the Reef a Marine Park the boundary of which is quite close to Gladstone) or - if greatly moved - deny an "import license" for the bringing in of the nodules, which the High Court of Australia has held it may do for environmental reasons.

B. Background Factors

1. Geography, Climate and Population

Queensland, in northeastern Australia, has a 4,000 mile coast, which, despite a "barrier reef, makes it an excellent geographical prospect for a nodule processing plant. Bureau of Statistics, Queensland Office, Queensland Yearbook (1982).

That Great Barrier Reef parallels nearly the entire eastern Queensland coast. Gilpin, Environmental Policy in Australia 165 (1980); Queensland Yearbook, *supra*, 3.



THE TOTAL AREA OF QUEENSLAND is 1,727,000 sq kilometres, representing 22½ per cent of the area of Australia.

THE AREA WITHIN THE TROPICS is 933,000 sq kilometres representing 54 per cent of the State.

THE GREATEST LENGTH is 2,100 kilometres and the GREATEST BREADTH 1,450 kilometres.

EASTERN STANDARD TIME, 10 hours ahead of Greenwich Mean Time, is observed throughout the whole State.

URBAN CENTRES with population of

- 100,000 & OVER shown as ■ BRISBANE
- 40,000-99,999 shown as ■ TOWNSVILLE
- 15,000-39,999 shown as • CAIRNS
- 4,000-14,999 shown as • Bowen
- UNDER 4,000 shown as • Ingham

STATISTICAL DIVISIONS shown in Red

Queensland has typical subtropical to tropical climate, and is suitable for settlement in many parts of the state. Daytime temperatures are high from October to March. On the coast the sea breeze tempers conditions, although on the Tropical coast, north of Rockhampton, conditions are humid. Daytime temperatures in winter are mild. Id. at 19. While Queensland is subject to tropical cyclones between November and April, a major cyclone with sustained winds of more than 110km/h will strike and likely plant site areas (e.g., Gladstone) only once in 40 years, though cyclones of lesser intensity occur more frequently (about three per season) somewhere along the coast. Id. at 30.

Queensland has substantial mineral deposits, which include manganese, copper, tin, and zinc, all of which are products of nodule smelting. Queensland Yearbook, supra, at 293.

As of 1980, Queensland had a population of 2,275,000, distributed primarily in the coastal areas, especially near Brisbane. Id. at 97, 99.

2. Ports

Queensland has 17 existing ports, six of which appear to fulfill the requirements for a manganese nodule processing plant: a draft of at least 12.2 m and sufficient space to handle 60,000 DWT ore carriers: Brisbane, Gladstone, Hay Point, Abbott Point, Mackay, and Townsville. Lloyds of London Press, Ltd. Ports of the World, 359-384 (1982); Queensland Department of Harbours and Marine, Annual Report 1982.

3. Government and the Division of Powers Between National and State Governments

Australia has a federal system of government. Under the Constitution the head of Australia is the Queen of England, who is also the Queen of Australia; she is represented by the Governor-General and state governors. The Constitution provides for national legislative powers to be vested in a popularly elected parliament. The popularly elected Parliament consists of the House of Representatives (lower house) and the Senate (upper house). Doing Business in Australia at 2. The parliamentary system of government is modeled on the British, and the federal system has features which somewhat resemble those of the U.S. and Canada.

Queensland is the only state in Australia which does not have a bicameral legislature. Its government consists of the Governor, the Executive Council (the Governor and the Ministers in office), and the Legislative Assembly. Queensland Yearbook at 67.

Local government authorities operate under legislation of the Queensland Parliament. There are presently 134 local authorities in Queensland, governed by local councils. Their powers and functions are set out in the Local Government section of the Public Finance Chapter. Decisions of local governments made under bylaws or ordinances controlling the use or development of lands are appealable to a local government court. Queensland Yearbook at 78.

The Australian Constitution is one of enumerated powers. There is a division of powers between the federal and state governments.

The federal Constitution gives to the federal or "Commonwealth" government powers over specific areas. All other powers are left to the states. Maxwell, Mining and Its Interaction with Commonwealth and State Laws Relating to Environmental and Aboriginal Issues, Australian Mining and Petroleum Law Journal Vol. 4, no. 1, p. 56. Neither mineral resources nor the environment are among those specific powers. Consequently, the states would appear to have the power not only to dispose of their mineral resources, but to regulate land use and environmental matters as well. Maxwell, supra, at 56. Of course, in the event of overlap and where the law of a state is inconsistent with the law of the Commonwealth, the Commonwealth prevails. Crommelin, Environmental Considerations in Energy Production in American - Australian - New Zealand Law: Parallels and Contrasts at 378 (1980).

A unique and recent trend in Australian constitutional law is the use of commonwealth external affairs or corporations power to prohibit or halt a state authorized project for ecological reasons, or to use a "people of any race" power to protect archaeological and cultural sites. See Coper, The Franklin Dam Case at 2-3. The degree to which the Commonwealth will exercise these powers to restrict state developments will depend, in part, on the contemporaneous political climate. For most of Australia's history as a federation, the Commonwealth government has had almost no role in regulating mineral resources or environmental concerns. Now, the dominant trend is toward broad Commonwealth power in these areas, and the Franklin Dam case is indicative of this trend. Commonwealth v. Tasmania, known popularly as the Franklin Dam case, is critical to an analysis of applicable Australian law to such as a processing plant because it upheld in principle Commonwealth policies of environmental protection as embodied in an international convention over a state economic development policy. Tasmania authorized the construction of a large hydroelectric project on the Gordon River in order to provide low-cost energy to stimulate development and boost

employment. The national government, on the other hand, was committed to stopping the project to protect Tasmanian wilderness areas, and issued regulations making its construction illegal under the National Parks and Wildlife Conservation Act of 1975, section 69, which authorized regulations for giving effect to certain international agreements, including the UNESCO Convention for the Protection of the World and Natural Heritage. The issue before the High Court was whether section 69 could constitutionally authorize national prohibitions on state-authorized dam construction by the Tasmanian Hydro-Electric Commission. Soon thereafter, the Commonwealth passed the World Heritage Properties Conservation Act of 1983, which similarly prohibited such dam construction through regulations issued pursuant thereto. A majority of the High Court upheld the power of the Commonwealth to prohibit dam construction under Commonwealth external affairs power set out in the federal constitution, which was held clearly to extend to the implementation of treaties like the aforementioned convention, and the power is not restricted merely because it deals with an internal matter for which there is no other independent source of power in the Commonwealth to control. It is not limited, said the Court, to subject matter which is only international in character. The case is widely regarded as an indication of growing federal (Commonwealth) power at the expense of the states of Australia, certainly in the area of environmental protection. Coper, The Franklin Dam Case, pp. 1-25, though some experts doubt the case will be repeated.

There are, however, two limits on the use of such as external affairs power to affect state actions or developments. First, the regulations must be appropriately related to the purpose of any treaty relied on: the regulations must be a manner of implementing the treaty's objective and not as a general grant to legislate broadly within the treaty's subject area. Thus, World Heritage regulations cannot go beyond protecting specified cultural or historical property. Second, the underlying treaty must be bona fide, to prevent the Commonwealth from creating a treaty for the primary purpose of extending its power into a state area. Franklin Dam, supra, at 9-10.

Limitations on the Commonwealth power to regulate corporations are even less constraining than the external powers limitations. The Commonwealth may, under a broad interpretation of its enumerated powers, regulate non-trading activities such as manufacturing and mining. Franklin Dam, supra, at 13-14. The scope of the federal power seems to be commensurate with the type of corporation. Therefore, where Commonwealth law addresses trading corporations, manifestly placing those corporations within

federal regulatory domain, the law may regulate any pertinent activity of that corporation, including external activities. The Commonwealth may be able to indirectly control corporate activities ostensibly subject to exclusive state regulation and can thus supersede any state permits, contracts or project schemes. The majority in the Franklin Dam case applied a substantial activities test to determine if the corporation came with the federal ambit. Only where the federal regulation affected the state integrally - either by regulating a proportionately large section of the state or by regulating state government buildings - might the state be protected. Franklin Dam at 22.

The Commonwealth also has paramount authority over Crown land, "acquired by the Commonwealth for public purposes." Section 52, Australian Constitution. Franklin Dam, supra. This may be important depending upon the location of a site. Although the 80.4 percent of Queensland that is Crown land (1983 Queensland Year Book) is subject to Land Administration control, the Commonwealth Place (Application of Laws) Act 1970-1983 provides that State - here Queensland - law governs in the absence of specific Commonwealth legislation to the contrary. State-authorized projects on Crown lands may be subject to federal environmental controls because ecological factors are an important component of the public interest equation. Bates, Crown Land at 33.

C. Commonwealth Foreign Investment Policy

The Commonwealth may regulate the project through its control of foreign investments. All foreign investment activity requires approval from the federal Foreign Investment Review Board. Letter from R.H. Bambrick, Department of Home Affairs & Environment, 19 Oct. 1983. The program may fall under the categories of Mining or Mineral Processing. "Mining" is defined to include the extraction of minerals and hydrocarbons. The initial grading or screening treatment necessary for a mineral to be transformed into a salable product is considered part of a mining project. Australia's Foreign Investment Policy at 12.

"Mineral processing" refers to the operation by which a mineral undergoes a chemical change or a change in its nature or state that is beyond the initial grading or screening treatment necessary for the mineral to be transformed into a salable product. Included within this category is alumina refining smelting; pig iron, steel and ferro-alloy production; smelting and/or refining of gold, silver, lead, zinc, nickel, copper and tin; synthetic fuel production; and others. Id. at 13.

New mining proposals that project a total investment in excess of five million will generally be required to be composed of at least 50% Australian equity coupled with at least 50% Australian control. Exceptions may be made where Australian equity capital is coupled with at least 50% Australian control. Exceptions may also be made where Australian equity capital is not available at reasonable terms. In such instances, the government will delay the 50% equity/ownership requirements in order to avoid stifling development of Australian natural resources. However, as regards mineral exploration, foreign interests are not obligated to seek Australian participation. Id. at 12.

II. Property Law

A. Land Tenure

The greater part of Queensland (73.8%) is Crown land held under lease and controlled by the Land Administration Commission under the Minister for Lands and Forestry. The Department of Mines controls the leasing and licensing of Crown lands for mining and incidental purposes. Australian Bureau of Statistics, Queensland Yearbook, 83 (1982).

Freehold land is nearly all registered under the Torrens system and all transfers and interests in such land are recorded by the Titles Office on the Certificate of Title. Id. at 84. The Certificate of Title will at any time reveal the exact position of the land in question, its dimensions, present owners, and any encumbrances to which it is subject. Martindale-Hubbell, vol. VIII, 3459 (1982).

The leasing of Crown land is the function of the Land Administration Commission. Types of leases include special leases though not mining leases, which is governed by the Mining Act 1968-1983, administered by the Mines Department. Queensland Yearbook, supra, 84-86. Special leases are conditional leases of Crown land for specific manufacturing, industrial, residential or business purposes. The leases are for periods of up to 30 years, and may be converted to perpetual leases or freehold. Id. at 86. Special leases are also made available under the Industrial Development Act (1963) with a rental assessed on the basis of 3 percent of the unimproved capital value; if the terms of the lease are upheld, it can be converted to freehold or perpetual lease. Baker, Multinational Gladstone: Developers' Feast, Social Famine, RAPIJ, August 1981, 102, 103.

The Land Act is administered chiefly by the Land Administration Commission. The Commission's jurisdiction covers all leasehold lands, lands being freeholded by installment purchase, vacant Crown lands, roads and reserves. These area

occupy 80.4 percent of all Queensland. 1983 Queensland Year Book. The Land Act is a consolidation of the law relating to the alienation, leasing, and occupation of Crown land. The Act authorizes the setting aside of land as a reserve for a public purpose. It also authorizes the appointment of trustees, responsible to the Land Administration Commission, to manage the reserves.

The Act provides for the setting aside of areas for roads, and for closure of roads and for preservation of dedicated road areas serving as access to freehold, leasehold, and reserved land. Id. at 3.

The Act also provides for the reservation of lands for conservation-related purposes, including parks, gardens, recreation grounds and environmental parks. Environmental parks are administered by the National Parks and Wildlife Service.

Destruction of trees on Crown leases, destruction of noxious weeds, prickly pear and harrisia cactus, and overstocking are also matters regulated under the Act. Id. at 7.

Mining leases may be granted for winning of minerals from land and other associated purposes, and are subject to conditions such as continuous use, payment of rental, and performance of labor conditions. Queensland Yearbook, supra, 87. A manganese nodule processing plant would probably fall under special lease procedures, rather than a mining lease. Activities aside from the extraction of minerals which are included in the definition of mining are generally those carried out at or near mine sites as an integral part of mining operations, while establishments mainly engaged in refining and smelting operations are excluded. Id. at 296.

There are no restrictions imposed on foreigners' owning land. There are, however, guidelines for foreign investment set by the Commonwealth, but they do not have force of law. Guidelines suggest minimum local equity participation in new ventures especially in mining projects, but if suitable local equity is unavailable then greater foreign investment is permissible. Martindale-Hubbell, vol. VIII, 3459 (1982). (See Foreign Investment, infra, for guidelines.)

B. The Australian Heritage Commission Act 1974

The Australian Heritage Commission Act establishes a register of the National Estate to protect those places which are "components of the natural environment of Australia or the cultural environment that have aesthetic, historic, scientific or social significance or other special value for future generations as well as the present community." The National Estate in 1981 -

A Report of the Australian Heritage Commission, Canberra, 1982 at 26. The Act prohibits Commonwealth Ministers or other Commonwealth authorities from taking actions that might adversely affect a listed place.

Among the Queensland listed areas is the Great Barrier Reef, various lowland tropical rainforests (found only in Queensland).

A processing plant located in Gladstone could be said to affect the Reef, and so trigger the Act's restrictions and procedures, as set out below.

The National Register is subdivided into three major groups: Natural, Historic and Aboriginal. The Aboriginal sites are nominated by the Australian Institute of Aboriginal Studies, National Parks, nature reserves and Aboriginal reserves are nominated by state governments. The historic areas and structures are classified by the National Trusts. Additional natural areas may be nominated by the Nature Conservation Councils in each state. Id. at 27.

An important consideration in evaluating the impact of the Register is that the listing of a place is not per se a preservation order. The listing itself does not preclude activities such as mining, forestry, or recreation. Further, the Heritage Commission, which formulates the Register, has an advisory role only. However, while it lacks authority to do anything to protect a listing, The Register of the National Heritage at 43, under sec. 29 of the Act, the Commission may furnish a report to the Minister for Home Affairs and the Environment in any situation where the Environment Protection Act applies but no EIS was requested, which must then be treated as a recommendation under that Act to be taken into account by a government decision-maker. Barker, Conservation Law in the A.C.T., 1983, at 101.

The actual listing must first pass through an interim list. All interim listings are accorded the same protection as Register listings. Procedurally, the nominees appear first in the Gazette. Id. at 45. The Register listings are published in The Heritage of Australia. Included is a statement of significance, photographs, and where possible, maps. The Register list is also available at the Commissioner's office.

[C. Rural Property

Acquisitions of rural property come under the ambit of either the Foreign Takeovers Act - if the property is part of an operating farm or other rural business, or is covered by the government policy regarding foreign real estate investments.

Rural properties must first have been offered for sale to the Australian market prior to acquisition by foreign purchasers. This is to ensure that interested Australian parties have been given ample opportunity to bid for them. The adequacy of the bid is assessed individually by the Foreign Investment Review Board.

Approval by the Board of proposed acquisitions by foreign investors usually is limited to one of the following categories:

- (1) those that offer significant economic benefits,
- (2) those where economic benefits are low, but which provide for an effective (usually 50/50 ownership and control) partnership between Australian and foreign investors, and
- (3) those where the purchasers have bona fide Australian residency plans.

Criteria that function significantly in ascertaining economic benefits are: the State or Territory's opinion regarding the above categories; the introduction of new technology; the promotion of new markets; or other factors of industry-wide significance.]

III. Queensland Land-Use Law

A. Statutory Framework

The land use control system is one of two legal frameworks which will control the location of a processing plant in Queensland. About a special regime just for a plant - a distinct possibility, as noted below - the following basic local-implemented land use system governs. In Queensland, responsibility for planning has been statutorily delegated to local councils, although the state retains ultimate power to approve a planning scheme, through the Local Government Department. Fagence, Massive Projects in Queensland Lack a Regional Plan, Australian Planner, Feb. 1982, at 19. Authority for Local Councils outside of Brisbane to prepare planning schemes is derived from section 33 of the Local Government Act. Sec. 33(2)(a), Fogg, Australian Town Planning Law, 14-18 (1982). Brisbane has authority to prepare schemes under the City of Brisbane Town Planning Act of 1964 (state legislation). *Id.* A Greater Brisbane Town Planning Committee, created by an earlier statute, prepared a town plan which came into effect in 1965. *Id.* at 15-16.

Queensland has no special planning authority for the whole state. Local planning is supervised by the Minister for Local Government and Main Roads, advised by the Department of Local Government. Id. at 67.

There are four administrative functions essential in Australian town planning administration: a planning authority, approving authority, development control authority, and an appeal body. In Queensland, the planning authorities, which are responsible for the development of plans and regulations, are the Brisbane City Council in Brisbane and the Local Councils in the rest of the state. The approving authority is the Minister of Local Government and Electricity (Minister) advised by the Department of Local Government. The development control authorities, which are responsible for the administration, implementation and enforcement of the scheme, are the Brisbane City Council and the Local Councils. Sec. 33(4)(a). These bodies are also responsible for reviewing the scheme every five years. Sec. 33(4)(b). The appeal body in Queensland is the Local Government Court, which is constituted at the District Court level. Fogg, Australian Town Planning Law, at 54 (1982).

B. Town Planning Schemes (Zoning) in Queensland

Town planning schemes are roughly equivalent to zoning ordinances in the United States. There are four steps in the making of local schemes: formulation, exhibition, submission, and approval.

The preparation of town planning schemes is permissive, not required of Local Councils. Sec. 33(2)(a). If a council opts to prepare a scheme, the local council first passes a resolution defining the area to be included. The resolution is then forwarded to the Minister for Local Government, whose approval is required. Sec. 33(2)(b). The Local Authority must proceed with preparation within one year of approval. Sec. 33(2)(d). Fogg at 114.

Once the scheme is prepared, the council advertises its intention to make application for approval to the Governor-in-Council, stating that the relevant maps are on exhibition at the office of the council, and that objections may be lodged. The public exhibition continues for not less than 90 days, during which objections to the scheme may be lodged. Sec. 33(3)(a). The local authority then considers every objection made in the prescribed manner. Sec. 33(3)(c). Fogg at 130-131. The local council makes application for approval of the scheme to the Minister within 90 days of the last day of receipt of objections. Sec. 33(3)(d). Fogg at 134-35.

Outside Brisbane once a submission is made the Governor in Council must consider the application and all objections and representations accompanying the application. He then has three choices: to reject the application, to approve it as it stands, or to give partial approval, which includes the power to make any amendments he deems fit considering the application, objections, and representations. Sec. 33(3)(e). Once approved the scheme is "gazetted" and becomes effective as a legal instrument. Fogg at 138-139. It has binding effect in law on both the general public and the local authority which is to administer the scheme. Sec. 33(3)(f). Fogg at 137. (The scheme differs but this is irrelevant for purposes of our study as no processing plant is contemplated there.) According to guidelines in the Local Government Amendment Act 1980 Queensland planning schemes must include a strategic plan and may include one or more development control plans. Day, Strategic Planning in Queensland, Australian Planner, 48, Feb. 1982. Strategic plans are defined as specifying "in general terms" the future preferred dominant uses for the town planning scheme area for the period for which the scheme has effect. Fogg, at xliii n. 22. The development control plans are elaborations of scheme proposals in particular areas. Day, supra, at 48. In both cases, the plans must incorporate a statement of objectives and proposed means of implementing them. These plans are in addition to traditional zoning maps and local legislation. Fogg, at xliii, n. 22. An approved town planning scheme is in effect a zoning plan. Fogg at 168. In Queensland, outside of Brisbane, the town plan consists of a written part, which is the Order in Council, and a series of maps. Id. at 188.

The contents of the Order in Council is as follows:

Part I contains definitions.

Part II deals with zoning and consists of definitions of the various zones in terms of the way they are colored on the scheme maps. This is followed by a table of zones setting out the permitted uses for each zone, prohibited uses, and uses which may be permitted by the council.

Part III safeguards existing lawful uses.

Part IV places obligations on the Council to keep records of various kinds connected with planning. Id. at 188-189.

The Order in Council is generally supplemented by "bylaws." Under the Local Government Act, the local authority has the power to make all such bylaws as are necessary or convenient to implement the scheme and to provide for, regulate, and control the administration and execution of the scheme. Sec. 33(21)(a). The bylaws, which form a part of the scheme, are used for

development control purposes in order to implement the formal town planning scheme. Fogg at 167. These bylaws are directed towards laying down guidelines for development in terms of building lines, site lines, density, setback, etc. Fogg at 167, 189.

Rezoning in Queensland, through amendment to a town planning scheme, may be initiated by application of the Local Authority [sec. 33(5)], on recommendation of the Minister [sec. 33(6)], or on application for rezoning by an individual [sec. 33(7)].

Under a 1981 amendment to the Local Government Act, section 33(6A)(e) introduces a number of specific criteria for rezoning, which include subdivisional and environmental questions. Among issues which are now firmly fixed as relevant for both councils and the Local Government Court to rezoning applications are traffic problems, amenity, the balance of zones, strategic planning, flooding, and the availability of essential services to the land, as well as questions of environmental degradation. *Id.* at xxiv. (Either an unsuccessful applicant or an objector may appeal the local council's decision to the Local Government Court.)

C. Interim Development Control

The concept of interim development control exists in all states in Australia. *Id.* at 102. The intent of interim development control is to prevent any alteration in the status quo of land which may prejudice the ultimate plans for its development. *Id.* The local authorities have the power to make bylaws for the purpose of interim development control under the Local Government Act section 33(21)(b).

In principle, it is only a temporary expedient requiring local government approval for any change in the existing use of land during the period between the creation of a local planning authority and the enactment of a formal zoning map. Roddewig, *supra*, ch. I, p. 3. However, local governments often prefer the discretion to grant changes under interim development control where there is no requirement of public hearings or state approval for changes in the use of land. After zoning schemes have been enacted, local councils will often suspend provisions as to particular zones, temporarily placing the zone in interim development control, and allowing the local authority to approve applications for changes in use without the requirement of state approval. *Id.*

Interim development control is more sweeping than formal town plans in Australia. Whereas only "incompatible" uses require formal rezoning under map planning, all changes in the use of land require local permission under interim development control.

The court has generally been hesitant to rezone on appeal, and has instead been inclined to grant specific relief for a specific project at a specific location. *Id.* at 231. In considering an appeal, some factors are: the need in the area for the particular use or services to which it is proposed to put the site; the availability or otherwise in the area of other land of the same zoning as that which is sought in respect of the subject site, and which might be put to the proposed use; the proximity of the subject site to the zonings sought in respect of it; the effect of the rezoning and the proposed development on the amenity of the locality; and whether the rezoning and the proposed development is likely to create a traffic hazard. *Id.* at xxiv.]

In Queensland, provisions are made for compensation to be paid to a property owner for "injurious affection" by a town planning scheme in section 33(10)(a) of the Local Government Act. *Id.* at 431. Any person who has an estate or interest in land which is included in an approved town planning scheme, where such estate or interest is injuriously affected either (1) by the coming into operation of any provision contained in the scheme, or (2) by any prohibition or restriction imposed by the scheme, can claim compensation. *Id.* at 432. Although "injurious affection" has not been expressly interpreted in Queensland, the Queensland arrangement for payment of compensation probably rests on the supposition that by virtue of the scheme, or actions taken under it, some land to which the scheme applies will be reduced in value, and the decrease in market value attributable to one of the matters in section 33(10)(a) is mark of whether an estate or interest has been injuriously affected. *Id.* at 435. However, there are circumstances under which no compensation is payable, such as where a scheme zones land for a particular purpose. Sec. 33(11)(a); *Id.* at 445-458.

The statute also imposed additional special requirements for entitlement to compensation where zoning is for a public purpose. Sec. 33(10)(b). [First, the land has to be sold after the scheme comes into force. Sec. 33(10)(b)(i). In this case, the Local Government Court must be satisfied that the owner sold the land for less than he would have received if there had been no restriction and that the owner sold the land in good faith and took reasonable steps to obtain a fair price. Sec. 33(10)(c). Second, the owner has been unable to sell the land after taking reasonable steps to obtain a fair price. Sec. 33(10)(b)(ii). Third, the Local Authority refuses an application for permission to use the land or erect a structure on it, and the Local Government Court is convinced that the application is in good faith. Sec. 33(10)(b)(iii); sec. 33(10)(c); *id.* at 439-440.] Queensland has no direct laws or regulations concerning betterments (a payment extracted from private landowners in return for some state action that increased the value of their property). Fogg, Australian Town Planning Law at 509.

D. Regional Development Alternatives to Local Land Planning Control of Land Development

Under Part VI of the State Development and Public Works Organization Act, entitled Planned Development, the Governor-in-Council may, on recommendation of the Minister, declare any area to be a state development area. Section 48(1); Fogg, supra at 557. The Co-ordinator-General must then prepare a scheme for the area as soon as is practicable. After approval by the Governor-in-Council, the Co-ordinator-General implements the scheme. Section 51(1)(c).

To facilitate implementation of the scheme, the Co-ordinator-General has the power to acquire land situated within the development area for the purpose of:

- (1) Providing for the establishment or relocation of population, industry or essential services, or
- (2) Replacement of open space as necessitated by development, natural disaster, war, civil strife, poor planning or obsolete development. Sec. 51(1)(c).

Once acquired, the Co-ordinator-General may, in order to implement the scheme, sell, lease or otherwise dispose of the land. Sec. 54; Fogg at 558.

Section 55 provides that such a development scheme will supersede zoning restrictions of a town planning scheme. Also, the Co-ordinator-General may either ask the Minister to have the local authority carry out pertinent works or may himself carry out certain works with the approval of the Minister and the Governor-in Council.

To facilitate large-scale development while at the same time avoid overtaxing local residents and existing infrastructure, the Queensland government provides special land use programs and procedures, at the state level, that address the land use and/or infrastructure needs of qualified large scale developments. The infrastructure policy provides for three basic alternatives: cabinet approval, prescribed development status, or a franchise agreement act. Ellis, Infrastructure Planning in Queensland - Policy and Legislation at 39; interview with Peter Ellis, interview with Alan Fogg.

(1) The simplest approach is where the developer merely submits his infrastructure package for cabinet approval. Id. at 40. Cabinet approval will ordinarily consist of titles and

procedures based on existing legislation. However, this approach may be impracticable for developments of any significant size because of potential coordination problems. Id.

(2) The prescribed development category, which includes mineral processing plants and mining developments. The objective of a prescribed development is the effective coordination of infrastructure planning and financing, while avoiding excessive costs to the state. Id.

(3) The Franchise Agreement Act, a statutory contract between the developer and the Queensland government that incorporates, inter alia, provisions regulating land use and infrastructure. These provisions supersede other state laws and local schemes and ordinances.

The two most feasible alternatives for a nodule processing plant are: the prescribed development and the Franchise Agreement Act. (Interview/Peter Ellis, Premier's Office.)

1. Prescribed Agreement

The Queensland government is empowered to declare a proposed project a "prescribed development" (pursuant to the State Development and Public Works Organization Act, as amended, 1981) if the development would either be of major economic significance to the state or if the required infrastructure for the proposed development would place an excessive financial burden on the state. Sec. 30. The effect of a prescribed development is to transfer all land use authority (including rezoning, land use and building permits and related authority) to the Co-ordinator-General. Florence, Development of Major Mineral Projects in Queensland. Prescribed status enables the developer to cut through red tape at the state and local levels, ignore zoning restrictions, and bypass otherwise applicable ordinances. The time-savings benefits alone may translate into a considerable economic advantage.

The preliminary mechanics for determining prescribed status commence with the Governor-in-Council, on recommendation of the Minister, ordering that an investigation of the proposed project be undertaken, Sec. 30. The Co-ordinator-General, who conducts the investigation, is empowered to compel the developer, a local body, or any person to submit pertinent information. Notably, this includes the details of all work connected with the development as well as any other information the Co-ordinator-General deems necessary (in order to properly discharge his function). Florence, supra.

On the basis of the investigation, the Governor-in-Council may or may not declare the proposed development to be a prescribed development. Sec. 32(2). Pending the decision of the Governor-in-Council as to whether the proposal will be allowed, the jurisdiction of the local authority to deal with any application relating to the proposal is suspended. Sec. 31.

If the proposal is declared a prescribed development, the Co-ordinator-General prepares an infrastructure coordination plan, Sec. 34(1), in consultation with the Queensland Treasury, other government departments, local bodies, and the developer. Sec. 34(2)(b). The plan will identify what infrastructure is required, the cost of such infrastructure, and the means of financing and coordinating provisions for infrastructure. It may also provide a framework for local bodies to make agreements with developers. Sec. 34(2). Once approved, every local body and other person specified in the plan must comply with the requirements of the plan in respect of the prescribed development to which the plan relates. Sec. 35(2).

In order to finance and provide infrastructure for a prescribed development in accordance with an approved plan, a local government may enter into agreements (and "do other things") as are necessary to comply with the requirements of the plan. Sec. 38(1). However, any such agreement must conform to the approved plan and be approved by the Governor-in-Council. Sec. 38(3).

Thereafter, all land use applications are automatically transferred from the local government to the Co-ordinator-General, for a determination by the Governor-in-Council whether to assess the application or return it to the local government. Sections 42 and 43(2). If the former, the Act's procedure may result in an approved application, which then has the effect of law, and (like a prescribed plan itself) supersedes all local land use schemes or bylaws. (Secs. 44-46.)

The Queensland government has set out policies regarding infrastructure for large development projects. For example, the total cost of all additional infrastructure (defined as those facilities, services and utilities that in the opinion of the Co-ordinator-General are required by or associated with a development or works) must be borne by the developer, this includes, water supply, sewage, street works, drainage, harbor facilities, electricity, and recreational and cultural facilities. It is not uncommon for the state to exact contributions to advance public interests beyond project needs, or to set prescribed development standards higher than the prevailing community standards. Florence, Development of Major Mineral Project.

The Queensland government provides only state social infrastructure such as schools, hospitals, and police stations, as necessary. [This applies to all projects, whether or not they have been declared a prescribed project. Queensland Approvals and Regulations Pertaining to Raw Material Processing Table 2.3, August 1981.]

Because the plan coordinates otherwise separate local processes, the prescribed plan avoids the delay implicit in a series of individual permits. A delay of six months could add (depending on prevailing rates) approximately 7-1/2 percent to the cost of a project. Fogg, supra at 4.

The prescribed development's most salient drawback (from the developer's point of view) is that it does not compel the government to consult with the developer before determining prescribed status. Neither the Minister, Treasurer nor the Co-ordinator-General are statutorily required to consult with the developer regarding formulation of the Infrastructure Coordination Plan, nor need they consider the developer's recommendations and opinions. Florence, supra at 22.

2. Franchise Agreement

The Franchise Agreement is a contract, passed by the Queensland Parliament, between the developer of a large project and the Queensland government. Queensland Approvals and Regulations Pertaining to Raw Materials Processing at 7. It has the force and effect of law. Rundle Oil Shale Agreement Act 1980 No. 34. A Franchise Agreement is effected when both the government and the company determine that the project is of such significance that normal administrative approvals and associated regulations might otherwise jeopardize, unduly delay or otherwise frustrate the project. Queensland Approvals at 7.

The agreement will override existing state legislation where appropriate. Id. at 7. It will also supersede all existing town planning schemes or limitations, including not only industrial and mining uses but all infrastructure conditions, both commercial and residential. Rundle Oil, at 44. Further, the agreement may incorporate and supersede already existing leases, such as mine leases, and may modify conditions of that lease. Rundle Oil, supra.

Of course, the Franchise Agreement may provide it is subject to existing legislation, in addition to manifest provisions relevant to environmental safety, Id. at 46, and it might further be deemed subservient to any later acts of Parliament, despite a clause explicitly providing: "It is the intention of the state and the companies that this agreement shall not be amended nor shall the rights and privileges of the

companies be derogated from (except as provided in clause 5 of Part I which provides for modifications only through and agreement between the Companies and the Government)." (Interview with Peter Ellis.)

The issue of whether a subsequent law can override a Franchise Agreement arose in Commonwealth Aluminum Corp., Ltd. v. Attorney General (1974 Queensland No. 1957). The Franchise Agreement passed in 1957, authorized Commonwealth Aluminum (COMALCO) and the government of Queensland to develop and mine bauxite reserves, and made any modification subject to a joint agreement between the Minister and COMALCO jointly, with the approval of the Governor-in-Council.

In 1974 the Queensland Parliament passed the Mining Royalties Act, which unilaterally imposed higher royalty rates on COMALCO in derogation of the 1957 Act. While the issue was never strictly resolved by a holding of the court (because the court granted a demurrer), the court indicated that "supercision" was valid.

The Franchise Agreement can probably protect the company from additional rates or charges that might be administratively imposed, if it specifically deals with the issue. Rundle Oil Agreement Act 1980. Moreover, where a dispute or inconsistency does arise, the Franchise Agreement may provide that the problem will be determined by a senior barrister (lawyer) or Queen's Counsel (Q.C.) appointed for the purpose.

The Act loosely divides a project into two stages. First is the initial risk stage, characterized by large capital expenditures. An applicant submits to the Minister evidence of satisfactory financing and necessary agreements with local authorities. Upon approval by the Governor-in-Council, the applicant may, pursuant to these local agreements, construct or otherwise implement the infrastructure. Then the company must substantiate (within ten years of the Act's inception) that they have the requisite technological ability (accounting for environmental safeguards) and have concluded contracts for industrial financing and other ancillary matters. Second is a full scale development stage, approval of which will be granted providing the companies meet certain required conditions: finance, technology, economic feasibility, environmental management and satisfactory local agreements. Rundle Oil, supra.

The Rundle Oil Act either provides specific land use restrictions, required actions or contributions, or expresses a method by which they may be determined. For instance, at the commencement of the Franchise Act, the company must surrender all leases of Crown land to the state, in exchange for special leases granted through the Act. The Act also provides that the Gladstone

City Council and the developer will formulate, through negotiations, an infrastructure agreement. It will include housing, temporary accommodations, utilities, roads, community facilities, financial arrangements, and provision for future additions. Upon completion of the construction phase, the developer must convey title to the city of Gladstone. The developer must also make a separate contribution towards infrastructure located within the city. Further, the developer must, during the construction phase, present detailed reports, etc., to the city on projected schedules and coordinate infrastructure requirements.

The Franchise also provides a rough outline for various subcontracts (for electrical power, harbor usage, water supply) to be negotiated between the local authorities or public instrumentalities and the developer. Generally, as in the infrastructure agreement, the developer will bear the costs of additional construction, though the public utility (e.g., the electric company) may do any necessary construction. Rundle Oil, supra.

However, the subcontracts are subordinate to the Franchise Act. They do not exempt the developer from tariffs imposed elsewhere in the Act that relate to the subject matter (e.g., the developer must still pay the electrical power tariff imposed on mining projects - this is explicitly specified in the Act). Rundle Oil Ecological Protection in the Franchise Agreement.

Finally, the Franchise Agreements may provide separately for environmental management. Premier's Department, Guide to Environmental Legislation in Queensland June 1983.

Procedurally, The Rundle Oil Act provides that the Minister of the Crown determines whether the plan is environmentally safe, based on the opinion of the relevant environmental minister, and explicit franchise provisions referring to state environmental acts, plus references to safety, pollution, rehabilitation, toxic wastes, and reasonable resource utilization. Id. at 14. Moreover, pertinent legislative provisions mandate environmental studies be undertaken as part of the overall planning of large projects in the state. Maxwell, supra at 67.

The Minister may order the suspension of any process (portending a danger due to toxic wastes) subject to an appeal to the tribunal. The tribunal has the authority to rescind the suspension but the developer bears the burden of proof concerning any fact in dispute. The developer must also comply with the Clean Water Act, 1971-1979, and submit both an environmental investigative study and periodic reports. Id.

The Governor-in-Council is endowed with extraordinary powers to protect public health and the environment. Where he finds that there is a danger of inadequate enforcement of a safeguard or that protective measure is of sufficient importance to be an obligation, the Governor may mandate compliance by unilaterally incorporating (by way of an Order in Council) the protective measure into the Franchise Act. Id.

IV. Environmental Law

A. Commonwealth

1. Environment Protection (Impact of Proposals) Act 1974

The most significant Commonwealth statute regarding environmental protection is the Environment Protection (Impact of Proposals) Act 1974. Crommelin, supra, at 380. The crucial functions created by the Act are the incorporation of environmental considerations into the decision-making process, and the preparation of environmental impact statements when the Minister so decides, supported by a public inquiry if the Minister so decides. Fisher, The Federal Environmental Protection Procedures, 8 Fed. L. Rev. 164, 173 (1977).

The key provision of the Act is section 5, which sets forth the object of the Act: to "ensure, to the greatest extent that is practicable, that matters affecting the environment to a significant extent are fully examined and taken into account in and in relation to" various decision-making processes of the Australian government. Id. The Act applies to decisions of the Governor-General, the Ministers, and all other Commonwealth (federal) officials and authorities (it does not bind those outside the Commonwealth administration). Kelly, Commonwealth Legislation Relating to Environmental Impact Statements, 50 Australia L. J. 498, (1976). As the above-quoted language suggests, the EIS is primarily for the purpose of providing information to a decision-maker. Barker, Conservation Law in the ACT, 1983, at Ch. 7.

The Act applies comprehensively to all "proposed actions" under the Act. Id. at 506. The person or agency who will initially formulate the proposal depends on the circumstances of the case. It may be a department of the federal government, a private developer who needs federal approval, or a state acting in liaison with the federal government. The common requirement is federal involvement. Fisher, supra, at 178.

Once a federal agency becomes aware of the project, the decision of whether a proposal falls within the object of the Act is left to the "Action Minister", defined as the Minister responsible for the proposed action. Kelly, supra, at 506. The Action Minister has a choice among three types of proposed actions. The type used most frequently does not involve an EIS - only a department assessment is needed. Second in frequency is the group requiring an EIS and its attendant public review. The threshold qualification for this group is that the project have "significant" environmental effects. Third is the public inquiry device, which may be held whether or not an EIS has been ordered. Id. See also Fisher, Federal Environment Protection Procedures, 8 Fed. L. Rev. 164, 173 (1977).

To determine whether an EIS is necessary, the Action Minister designates a person or department (the proponent) to collect information for the purpose of considering the necessity of an EIS. The proponent submits all relevant information to the Department of Arts, Heritage and Environment, which may either make an assessment of the data (in order to recommend to the Minister whether or not an EIS is necessary) or refer that assessment to the action minister. Only the Minister for Arts, Heritage and the Environment has the authority to direct the preparation of an EIS. Kelly, Commonwealth Legislation Relating to Environmental Impact Statements, 50 Australian L.J. 498, 506 (1976). (Interview with Barbara Graham and Rod Usbick, Canberra.) In practice, the EIS is usually prepared by the developer (acting as proponent) in duplicate so that it may be jointly assessed by both Commonwealth and state ministers. Poster Paper on EIS Procedures, supra at 3.

Once an EIS has been prepared, the Minister for Arts, Heritage and the Environment may make any comments, suggestions, or recommendations concerning the proposed action to the proponent. These may include recommendations concerning conditions to which the proposal should be subject which are thought necessary for the protection of the environment. Id. at 509.

Finally, the Action Minister is then under a duty to ensure "that any final environmental impact statement, and any suggestions and recommendations are taken into account in matters to which they relate." Sec. 8. It has not yet been determined whether this duty is judicially enforceable. Fisher, Environmental Law in Australia, 147 (1980).

There are two basic weaknesses in the EPA. First, the environmental safeguards are discretionary rather than mandatory. Second, the Act is subject to the discretion of not just the Environment Minister but also the minister responsible for the Commonwealth activity (the Action Minister). The Action

Minister may be biased in deciding whether the project falls within the ambit of the Act if he supports the project. This is critical, since the Environment Minister cannot stop projects that threaten the environment, but only make recommendations to the Action Minister. Maxwell, Mining and Its Interaction with Commonwealth and State Laws Relating to Environmental and Aboriginal Issues, 4 Australian Mining & Petroleum L. J. (1982) 64, 65.

There are also obstacles regarding judicial enforcement of the Act, having to do with standing to force the government to comply with its own procedures. Australian Conservation Foundation v. the Commonwealth, 54 A.L.J.R. 176 (1980), as discussed in Fowler, Legislative Framework for the Implementation of Environmental Studies: Some Recent Developments, 7 Adelaide L. Rev. 456, 476 (1981), and the doubtful legislative effect of the instruments spelling out EIS procedures. Fowler, The Prospects of Judicial Review in Relation to Federal Environment Impact Statement Legislation, 11 Melbourne Univ. L. Rev. 1 (1977). (Little in the procedures suggests that they may be judicially enforceable, and the intention of the executive and of Parliament was probably that they should not be enforceable. Environmental Law in Australia, *supra*, 147.)

The second mechanism (beyond the EIS) contemplated by the Act is the public inquiry. An inquiry may be held whether or not an EIS has been prepared. Fisher, Federal Environment Protection Procedures, 181. Aside from the requirement that such inquiries be held in public, the procedure of the inquiry is largely a matter for the discretion of the commission, and the commission is specifically entitled to disregard normal rules of evidence, thus rendering admissible matters of opinion and information from any source. Environmental Law in Australia, *supra*, 150. As of 1980, only two public inquiries had been held: the Ranger Uranium Inquiry and the Fraser Island Environmental Inquiry. Such inquiries appear to be reserved for issues of national significance and political controversy. Crommelin, *supra*, at 384.

The present state of the Act, and Commonwealth Environmental Protection, in general, may be about to change. The Act is presently being reviewed by the Commonwealth (the Department of Arts, Heritage and the Environment) to ensure that it incorporates both Commonwealth and state responsibilities. A major aim of this review is to avoid duplication of Commonwealth and state activity in this area. Arrangements have already been made for cooperation with some of the states to effect concurrent state/federal assessments of proposals. Maxwell, *supra* at 74.

In June, 1983, delegates gathered at a Conference Concerning a National Conservation Strategy for Australia to formulate "guidelines for the use of living resources by

Australians so that the reasonable needs and aspirations of society can be sustained in perpetuity" (NCSA paragraph 4). The conference established as national priorities soil erosion, protection of water resources and wetlands, widespread soil and water (excess) salinity, contamination of coastal waters and estuaries, declining fish stocks, and threats of introduced diseases and pests, among others. News Release: Minister for Home Affairs and Environment 3 August 1983. Illustrative of a changing national policy towards environmental protection is the conference introduction by the Minister for Home Affairs and Environment:

It is hard to believe that any Government could be asked to place the interest of the mining companies ahead of the preservation of one of the truly great wilderness areas of the world...

Summary Record of the Conference Concerning a National Conservation Strategy for Australia 1983 at 15.

The conference espoused a stronger role by government as well as by the wider community in ecological preservation, and recognized that "living resource conservation and sustainable development are interdependent." A National Conservation Strategy for Australia at 3. However, the strategy's objectives need not be achieved by radical legislative or administrative changes: the strategy suggests the development of an attitude of responsible stewardship and the implementation of these objectives through existing legislation and administrative arrangements in concert with voluntary practices by private industry. The Commonwealth Government and all Australian states except Queensland and Tasmania have now endorsed the National Conservation Strategy.

2. The Great Barrier Reef Marine Park Act (1975)

This Act controls ocean waste disposal and port construction in the vicinity of the Great Barrier Reef, and therefore can be expected to have considerable impact on a manganese nodule processing plant in a probable area like Gladstone, at the southern coastal edge of Queensland.

The Act divides the Reef into seven sections, which are protected and controlled by the Marine Park Authority. Each section may be regulated by a zoning plan prepared by this Authority.

The Marine Park Authority is a corporate entity, sec. 9(1)(a), empowered by the Act to do all things necessary or convenient to effectuate its purpose, including entering contracts, sec. 8(1)(a), acquiring or disposing of real property,

sec. 8(1)(c), issuing permits for waste disposal, sec. 15, and controlling Commonwealth property generally. Any Marine Park Authority function may be performed jointly with Queensland or other local authority. Sec. 8(3).

The Act governs all coastal waters that lie between the Australian mainland and a line just beyond the outer edge of the Reef between 10 41'S and 24 30'S. The scope of the Authority technically includes the Queensland coastline, and borders, but does not include, the port of Gladstone, which is regulated primarily by Queensland.

As soon as is practicable after an area has been declared part of the Park, the Authority promulgates a zoning plan for that area. Sec. 32(1). The objectives of the Zoning Plan are conservation of the Reef and regulation of Marine Park use, to allow for reasonable use of the Reef region but regulate activities that exploit the Reef resources, in order to minimize detrimental effects. Sec. 32(7).

Within each planning region certain areas are designated as "special areas". Such areas are treated as national parks or reserves and are managed under the National Parks and Wildlife Conservation Act. Gilpin, supra, 167-168.

The Zoning Plans are subject to public notice and comment after the Authority prepares them. Then the plan is passed to the Minister, who will accept it as is or suggest changes. Any plans with suggested alterations should be referred back to the Park authority for further discretionary consideration. The plan is then rerouted back through the Minister (who may accept the plan or alter it via an accompanying report) and pass it to both houses of Parliament, Sec. 32(11) et seq. Either of which may affirmatively disallow the Zoning Plan. If neither house acts within twenty days, the plan is passively affirmed. Sec. 33(4).

Generally the Zoning Plans divide the Marine Park into sections according to the degree of ecological protection. The most protected use seems to be a preservation zone, whether waste discharge is absolutely precluded. Waste discharge may be allowed in other zones provided the conservation, research, recreational and social objectives of the zone can be pursued. Permits are required for waste discharge in zoned as well as unzoned areas. See Applications for Permits, Marine Park Authority. The zones have somewhat diverse objectives, and the responsible agency, in issuing a permit, must have regard for these objectives as well as zone management, conservation of Park natural resources, the existing use and amenity and desired future use of the subject area and adjacent areas, the size, extent and location of the proposal (to any nearby use), the probable effects

of the proposal on adjoining and adjacent lands, any possible environmental effects, and access and egress. The decision of the agency is discretionary - it may refuse to grant permission, grant unqualified permission, or grant permission subject to conditions it feels are appropriate. Cairns Section Zoning Plan (November, 1983) Great Barrier Reef Marine Park Authority.

The present Great Barrier Reef zoning plans do not restrict activity in the immediate environs of the coast, including the ports. Sec. 7(1)(a). [Zoning plans are now in effect for Capricornia, Carnes and the Cormorant Pass Sections. The Authority stated in the September 1983 Gazette (the official government publication) that it intends to prepare a zoning plan for the Far Northern Section of the Reef.]

Great Barrier Reef Marine Park Provisions and Regulations.

Presently, the regulations promulgated therein make certain actions prohibited in the Reef area. The express prohibitions include the discharge of household, industrial or commercial waste in the Marine park (unless written permission is obtained from the authority) and subjects the offender to a \$5000 penalty. Sec. 15(1). However, this provision does not preclude the discharge of waste where the relevant Marine Park Zoning Plan manifestly permits it, sec. 15(2), or where the waste is biodegradable and the excreting vessel or aircraft is over 500 meters seaward from the seaward edge of a reef. Sec. 15(3)(c). (No provision or reference is made to pipeline waste conveyance.) Under sec. 38 of the Act operations for the recovery of minerals within the park are excluded except with the approval of the Authority. Such operations would be approved only for the "purpose of research and investigations relevant to the establishment, care and development of the Marine Park or for scientific research."

Reef activities may be circumscribed by water pollution regulations promulgated by the Governor-General. The regulations must be consistent with the Barrier Reef Act and Zoning Plan, and may apply outside as well as inside the Marine Park. Sec. 66(2)(e). Thus, if an action, such as waste discharge, that takes place outside the Barrier Reef might affect the water quality of the Reef, that action could be regulated. The regulations may apply to non-zoned as well as zoned areas. Sec. 66(3)(a)(b). However, the regulations do not apply to special zones, sec. 66(4) nor to areas still unprotected by a zoning plan two or more years after the passage of the Act.

In considering an application made to it for the granting of approval for a development or in considering the undertaking of works, it is the responsibility of [any government authority] when it appears that the undertaking of such development or works is likely to have major environmental effects, to take such environmental effects into account, and in so doing to have due regard to such policies or administrative arrangements as may be approved from time to time by the Minister to the extent that the same are compatible with legislation for the time being in force in the state.

Pursuant to this provision, policies and administrative arrangements for EIS's were promulgated by the Co-ordinator-General's Department in "Impact Assessment of Development Projects in Queensland" published in 1979. Crommelin, supra, at 387. While it purports to vest broad discretion in the government authority regarding EIS's, the policies and orders set out are said to have little legal effect, and may not be judicially enforced in case of breach. Fowler, Legislative Framework..., supra, 477. Neither the statute or guidelines purport to prescribe any form of substantive mandate on decision-makers comparable to section 8 of the Commonwealth Act to take into account environmental factors disclosed by an EIS. Id. Other suggested weaknesses include inadequate public participation in preparing and assessing EIS's; secret EIS's; ex post facto EIS's; and poor quality EIS's. Hundloe, The Deep North: Land Use Conflicts, RAPIJ vol. 16 no. 4, 139 (1978).

Arguably more effective is the power of the Co-ordinator-General under the Act to hold an inquiry into matters relating to the environment. Sec. 15. This inquiry has the status of a Royal Commission with compulsory powers, though whether to hold the inquiry is wholly within the discretion of the Co-ordinator-General. Fisher, Environmental Policy..., supra, 18-19.

2. Pollution Control

The Co-ordinator-General's Department, which is responsible to the Premier, has principal responsibility for environmental management and coordination of development programs. Four major statutory bodies work in conjunction with the Co-ordinator-General: the Air Pollution Council, Water Quality Council, Beach Protection Authority, and Soil Conservation Authority. Gilpin, supra, 39.

The basic framework for controlling pollution is the licensing of sources of discharge into the air or water. Public authorities may attach conditions to the licenses, such as the installation of pollution control devices, and the licenses are subject to revocation and penalty fees. However, not every activity which discharges waste into the air or water must comply with licensing procedures. A classification system is used for determining which activities must obtain licenses.

a. Air Pollution Council

The Air Pollution Council administers the Clean Air Act of 1963 under the auspices of the Minister for Environment, Valuation and Administrative Services. The object of the Act is to control air impurities (smoke, particles, gases, dust, mist, etc.) as well as offensive or noxious odors. Guide to, supra, at 24.

The Act provides for the appointment of a director of air pollution control and staff. The director is the head of the Division of Air Pollution within the State Department of Local Government. Gilpin, supra at 285.

The functions of the council are to carry out investigations into air pollution problems, and to make recommendations to the Minister relating to the administration of the Act, altering or repealing any provisions of the Act, and the prevention, abatement, and mitigation of air pollution. Sec. 13.

Industries are classified by the Act according to the threat they pose to air quality. The more restricted of the two categories is "Scheduled" industries. It includes plants, smelters and refineries. They are licensed by the Secretary of the Air Pollution Council and subject to an annual fee. Guide to, supra, at 18. The scheduled industry must submit an application for a license, accompanied by detailed plans of pollution potential. The license, however, is inferior to town planning laws and zoning schemes - it will not permit an otherwise restricted industry. Section 19(2)(c) 1978.

The council has broad powers to impose additional qualifications on the industry in order to control air pollution. Guide to Environmental Legislation in Queensland, supra, at 18. It may restrict the composition of emissions, specify chimney height, prescribe monitoring and dust-collecting equipment and specify the fuel to be used. Gilpin, supra, at 286. However, the Governor-in-Council can temper or nullify the council's decisions, and may go so far as to exempt an industry from the scheduling system and attendant limitations.

Water purity is protected by the Water Quality Council of Queensland pursuant to the Clean Water Act of 1971. The functions of the council are to carry out and commission surveys, investigations and research into matters relating to the quality of waters; to report and make recommendations to the Minister, and to maintain surveillance over the discharge of wastes. Gilpin, supra, at 249.

The Act creates what is basically a licensing system. The crucial principle is found in section 23(1), which provides that subject to the Act a person who is the occupier of premises from which wastes are discharged to any waters and who is not the holder of a license issued in respect of such discharge is guilty of an offense against the Act. It is for the Council to decide, subject to appeal to the District Court, whether to grant or refuse a license and what conditions should be attached. However, no application may be granted where the use of the land would contravene any statutory planning restrictions affecting the land. Environmental Law in Australia, supra, 172. Criteria for approval of a license include the character of the receiving water, practicable methods of treating the wastes, any water quality standards, any policies of the government regarding conservation or the environment, and any policies of the government regarding location of industries. Id.

The council may require the installation and operation of whatever technical devices and equipment are necessary to control the pollution and to monitor the control system. In granting a license the council may attach conditions that prescribe water-quality standards applicable to the discharge so licensed. The Governor-in-Council may also make regulations prescribing water-quality standards. Id. 173.

Provision is made in the Act for progressive compliance with conditions of a license over a period of time. The Water Quality Council may grant compliance delays of up to four years to prevent undue hardship, and the Governor-in-Council can increase the time to seven years in special cases. Gilpin, supra, 249.

Moreover, certain projects may be completely exempted by law (e.g., Franchise Agreement Acts) or by administrative order from licensing by the Act. Where the government has made such exemptions, environmental clauses have usually been incorporated into the contract. Gilpin, supra, at 40. Finally, the Governor-in-Council has the authority to rescind any decision or order of the Water Quality Council. Id. at 249.

Another water pollution control measure that may directly or tangentially affect the processing plant is the Sewerage and Water Supply Act. The Act provides for Local

Authority control over discharges to a sewerage system in order that the final affluent from the system may comply with the license issued under the Clean Waters Act. Controls may be placed on permitted and prohibited discharges, and standards for sewers may be set. This Act also provides for sewage works to avoid blockages and overflows. Id. at 19.

3. Water and Shoreline Controls

The responsibility for the planning and development of the water resources of Queensland rests with the Commissioner of Water Resources who is appointed under the Water Resources Administration Act. The broad responsibilities of the Water Resources Commission cover multi-purpose planning and management encompassing water-supply and use by residences and industry and agriculture, as well as power generation and flood mitigation. The functions of the commission include determining present and future water needs and the formulation of plans for water conservation, including construction and operation of public works.

The Water Act regulates non-tidal waters only. It vests management and right of use of all Queensland waters in the Crown, as well as waterbeds and banks. Uses or activities that are pertinent to a manganese nodule plant and might require a license include:

- (1) Private storage of water in weirs, dams, etc.
- (2) Diversion of water from watercourses and groundwater.

The Act empowers the Commissioner of Water Resources to, inter alia, enter into contracts to supply water privately or to a local authority, and establish specific water and drainage areas. Guide to Environmental Legislation in Queensland - June 1983.

The Beach Protection Act created the Beach Protection Authority in 1968, consisting of an executive committee, an advisory committee and a secretariat composed of engineers and scientists. The Authority utilizes a "buffer zone" policy, whereby buffer zone plans, produced for the eastern coast of the state, identify land use areas over which control should be exercised. The plans show land which is calculated to be vulnerable to erosion within the next fifty years. Gale, Coast and Beach Protection in Queensland, Australia Shore and Beach, January 1979, 4-6.

The Act empowers the Beach Protection Authority (BPA) to assess and recommend to the Governor-in-Council the establishment of a Beach Erosion Control District. Following the official declaration of such a district by the governor, the BPA can regulate, under an approved plan:

- (1) The erection of buildings and subdivision of land within the protected district, and
- (2) certain activities likely to threaten beach conservation on unoccupied Crown land within the district.

Guide to Environmental Legislation in Queensland at 11.

Overlapping the Beach Protection Act is section 29(2) of the Fisheries Act, which provides for the establishment of marine park areas. Bates, Environmental Law in Australia at 78. The Minister, acting upon the Co-ordinator-General's recommendation, may declare any area to be a protected park. Guide to, supra at 12. The physical boundaries of the park include the tidal waters, land within the area, subsoil, superadjacent air space and all marine products within the protected area. Id. Marine products include all forms of indigenous plant and animal life, aboriginal remains, wrecks and relics. Sec. 6. The primary objective of a marine park is conservation, and may include areas of scenic, scientific or historical interest as well as areas requiring preservation of marine life. Bates, supra, at 79.

Queensland Marine Parks may coincide with the Great Barrier Reef Marine Park and other Commonwealth declared areas. However, where inconsistencies emerge, the Commonwealth regulations will control. Id.

The Harbours Act empowers the Harbour Authority to promulgate bylaws regulating the removal of rock, stone, gravel or any other materials from harbors, shores and seabeds within Queensland's jurisdiction or other waterbeds underlying a harbor. These regulations will be pertinent to harbor construction. Guide to, supra, at 16-17. The Act also authorizes the Governor-in-Council to permit a private party, Harbour Board or Local Authority to reclaim land where it will not interfere with another's right or interest in land, will not interfere with navigation, and where it is expedient to permit reclamation. Id.

The Queensland Marine Act empowers the Queensland Marine Board, subject to the Minister, to grant permission to remove rock, stone or any other material from the area of a declared harbor which is otherwise unprotected. The Act also empowers the Board to promulgate water pollution restrictions. Id. at 17.

The Fisheries Act protects the habitat as well as the living resources of the sea in order to effectuate its primary aim: fishery conservation, protection and management.

A permit is required for any action that involves: (1) conversion destruction, or modification of an aquatic habitat and contiguous land areas, (2) construction of a tidal barrage (dam) on any major coastal river, (3) dredging, filling, harbor construction, beach replenishment, or any works that directly or indirectly affect tidal lands or other aquatic habitat, (4) activities likely to affect the socio-economic structure of fisheries or the alternate utilization of aquatic resources. Id. at 8, 9. Permits are issued under the Fisheries Act for the extraction of fossil coral (limestone), which may be used in manganese nodule processing. See Jenkins, The Feasibility and Potential Impact of Manganese Nodule Processing in the Puna and Kohala Districts of Hawaii, Nov. 81. The Fisheries Act may affect harbour location, waste disposal and tailing ponds.

4. Other Environmental Land-Use Restrictions

a. National Parks and Wildlife Act

This Act is administered by the National Parks and Wildlife Service. The Governor-in-Council, upon the recommendation of the Director of the National Parks and Wildlife Service, may choose any Crown lands to be set aside as a national park. This is effected through the Governor's Order. The primary criteria is that the land be of some scenic, scientific, or historic interest. The primary purpose is conservation. The National Parks and Wildlife Service also administers the Native Plants Protection Act, the Fauna Conservation Act, and the Land Act (as it pertains to environmental parks). Guide to, supra.

b. The Mining Act

The Mining Act endows the Minister of Queensland with the power to regulate the discharge of mineralized or impure water, sludge, or debris into the sea, lake, water course or adjacent land. Though the harbor, transport terminal, and processing plant are not mining activities, the ecological policy expressed therein may foretell the regulation of similar wastes by the Minister from a processing plant pursuant to other empowering statutes (e.g., the Water Resources Administration Act).

However, even this Mining Act control is flexible - the Minister may allow mining notwithstanding the danger of pollution if he deems the mining activity to represent the greater public interest.

Specific provisions address rehabilitation of mining land. These provisions should be taken as guidelines for what the government may require for rehabilitation of the project's land waste disposal system as discussed in the Jenkins report at 15.

V. Conclusion

The Director of the Department of Commercial and Industrial Development has suggested that Gladstone is probably the premium site for the establishment of a manganese nodule processing plant in Queensland. Gladstone has an industrial estate for use by large scale processing industries, existing port facilities capable of handling ore ships of 100,000dwt, and developed infrastructure. Letter to David Callies, dated 7/6/83.

A. State of Queensland

Developments generally fall within the jurisdiction of the state government. The Department of Commercial and Industrial Development is responsible for any proposal concerned with manufacturing or processing in the state. Queensland Government Approvals and Regulation Pertaining to Raw Materials Processing, App. I, p. 1.

Any major raw material processing industry establishing in Queensland must satisfy the government of its worth. The company involved with a project, after preliminary discussions with various government departments, would normally approach the government with their final plans for development. The information which would accompany such an application includes: the nature of the product; plant size, location and capital cost; expected start-up date and construction period; size and nature of construction and operational work force; nature, quality, and source of raw material required; transport requirements for raw materials and product; power and water requirements and tentative prices reached with appropriate authorities; infrastructure requirements; and effluents, their treatment and means of disposal. Id. at 2-4.

Following the formal notification to the government of its development plans, the company may be required to prepare an impact statement. Whether or not an impact statement is required will be determined by the government department, Crown Corporation, or local body authority responsible for granting approvals to the proposal. Where more than one responsible authority is involved, the Co-ordinator-General may coordinate the study requirement. Id. 4.

An impact statement will normally consider the infrastructure needs and the social and economic consequences of a development as well as its environmental effects. The policies and administrative arrangements relating to such statements are required by section 29(2) of the State Development and Public Works Organization Act 1971-81, and will be discussed more fully below. Id., 4-5.

After the impact statement has been approved, the government departments (principally the Co-ordinator-General's Department) will, in consultation with the company, determine the most appropriate classifications of the project. Id. at 5. Large scale development projects will most probably be permitted under "Franchise Agreement Act" or as prescribed developments. Ellis, Infrastructure Planning in Queensland - Policy and Legislation at 40. The project could also be classified as a "normal" project, thereby subject to local ordinances, Queensland Government Approvals, supra at 48, or an applicant may simply request that the cabinet approve an infrastructure proposal. However, coordination problems contraindicate both the "normal project" and council approval approaches.

Franchise Agreement Act: Where it is determined that a project is of such significance that normal administrative procedures may be so cumbersome as to jeopardize or unduly delay the project, a specific Franchise Agreement between the developer and the government is passed as an Act of Parliament. The Act presumptively supersedes all town plans and ordinances, prior relevant laws, and incorporates prior leases and contracts. The Franchise will also integrate subcontracts, dedications, contributions, environmental controls, and bilateral dispute resolution.

The Franchise Agreement is implemented through a multistage process involving investigation, formulation and submission of a plan; arrangements for financing; technological esoterics, construction contracts, and actual physical development. Each stage is dependent upon government approval.

The Franchise Act protects the developer by providing that modifications must be agreed to by both parties. The Act also incorporates an appeals process. However, the Act may be superseded by a subsequent Act of Parliament (see Commonwealth Aluminum Corp., Ltd. v. Atty-General, Queensland, 1974, infra.) and is subject to all relevant Commonwealth regulations.

Prescribed Project: A project may be declared a prescribed development where the infrastructure requirements are likely to place a major burden on the state or local communities, or where the project is of critical economic significance. The Governor-in-Council will evaluate an application to determine whether it warrants prescribed status. If it does, the Government will draw up an Infrastructure Coordination Plan (developer approval is not mandated in the Franchise Act). Additionally, the Co-ordinator-General (subject to the Governor-in-Council) may concurrently resolve ancillary land use/building applications, or may choose to remit the application to the appropriate local government body. Both the remitted and the retained permits must conform to the prescribed plan.

The prescribed plan and ancillary permits supersede all relevant state and local laws and zoning schemes, as does a Franchise Agreement. Moreover, where the ancillary permit is determined locally, the usual local appeal might be circumvented.

Comparison Between A Franchise Agreement and a Prescribed Development: The Franchise Act has the following advantages over the prescribed development -

- (1) In the Franchise Act, the developer has the right to appeal any modifications to an independent tribunal. In a prescribed development, not only is the determination of an application final and binding, Ellis, supra, but there is no provision for review. Florence, supra.
- (2) The Franchise Act gives the developer the statutory right to negotiate any modifications. In a prescribed development, the Governor-in-Council may unilaterally alter the developer's obligations. Id.
- (3) The negotiating and approval process is more centralized in the Franchise because it embraces all aspects of the development - land titles, water supply, railways and financial arrangements. Id.
- (4) Financing will be easier to obtain from private lending institutions under the Franchise as the developer's rights and obligations are relatively more secure. A simple Order-of-Council can effect a change in the prescribed development, while it takes at least an Act of Parliament or mutual agreement to modify a Franchise.

Conversely, the prescribed development offers the advantage of enabling the government to apportion the infrastructure costs of a specific facility among several joint users. The apportioning may be done at the outset, as with a new port, or

aligned with increased use and expansion, in order to avoid placing the burden of additional construction and maintenance costs on the initial developer.

However, significant political considerations may eliminate or narrow the choice. If the state government, as one commentator suggests, follows its current trend of not entering into Franchise Agreements, most major developments will be limited to prescribed developments. Florence, supra, at 6.

Normal Land Use Application: This is made to the appropriate local authority, as is determined according to the terms of the local town planning scheme.

Where the proposed use is not prohibited by the scheme and the local authority refuses the application, the applicant may appeal to the local government court.

Where the proposed use is prohibited by the scheme, the applicant may apply for rezoning, and may appeal a refusal to rezone to the local government. The ultimate decision in rezoning application lies with the Minister of Local Government and the Governor-in-Council.

Additionally, the Local Government Department is to be contacted regarding the establishment of any new industrial site.

Land Lease/Purchase: The vast majority of Queensland land is Crown land (80.4%). This land is leased out by the Land Administration Commission. The processing plant would probably require a special lease (30 years) if constructed on such land (note that much of the land in centers of population like Gladstone is freehold land). This may be converted to a freehold or perpetual lease.

A Franchise Agreement may incorporate a lease or, where a lease has previously been arranged, will integrate the lease into the Franchise Act.

In industrial areas, the Department of Commerce and Industrial Development may also be responsible for leasing land.

Non-crown land is freehold, and would have to be purchased in accordance with Queensland property laws.

B. Commonwealth Regulations

The federal government is a government of enumerated powers. The areas that primarily affect the project (land use, mineral resources, and the environment) are not explicitly given to the Commonwealth and consequently are left largely to the state. However, the Commonwealth can and may likely control (depending on the political climate) the project through a broad application of its specified powers and concerns. These concerns include regulation of overseas trade and commerce, including Crown Lands, External Affairs, corporations, the "people of any race power" (involves protection of cultural and historical sites) and territorial seas and seabeds. These powers also provide the requisite nexus through which the Commonwealth may regulate or even proscribe a state development for ecological reasons. See the Franklin Dam Case, *infra*. Additionally, any of these powers authorize the Commonwealth to require an environmental assessment pursuant to the Commonwealth Environmental Protection Act.

Where there are overlapping or inconsistent state/federal laws, the Constitution provides that the Commonwealth statute will control.

Commonwealth Environmental Protection

The most salient ecological control is the Environmental Protection (Impact of Proposals) Act, 1974. The objective of the Act is to ensure the incorporation of ecological and environmental considerations into the decision-making process, and can be applied to any project having some sort of federal nexus. The protective value of the action is severely limited by three factors: (1) The preliminary determination (of whether or not to order an EIS) is based on information that the developer (acting as proponent) submits. See paper submitted by David Walker to Queensland Environmental Law Association at 8. (2) The decision as to whether or not an EIS should be required is highly discretionary. *Id.* (3) The final evaluation, even where a statement is required, is also discretionary. (4) The Act lacks teeth. The Environment Minister can only recommend a course to the Action Minister, who is often a more economically inclined authority. The Environment Minister cannot directly halt an ecologically harmful project. Also, judicial enforcement is difficult as standing is limited to direct injury and judicial interpretation of the Act is problematic.

National ecological concern is waxing, as evinced by the Conference Concerning a National Conservation Strategy for Australia, held in 1983. The conference, attended by government officials, industry representatives and environmentalists, advocated increased conservation through private and government coordination.

The Great Barrier Reef Marine Park Act, 1975, will affect the project's waste disposal and port construction to the extent it regulates all activity in or affecting the reef. This is accomplished through a system of zoning plans and permits, and regulations promulgated by the Governor-General.

The Commonwealth National Parks and Wildlife Act, 1975, provides for the preservation of natural areas through the establishment of national parks and reserves in both Crown lands and territorial waters.

The Queensland government does not have an exclusive unitary authority responsible for environmental protection. Rather, the agency responsible for approving the project is charged with including environmental protection as a factor in its decision. Guide to Environmental Legislation in Queensland at 1.

The primary authority will likely be the Co-ordinator-General as he has the duty under the State Development and Public Works Act to ensure the various agencies involved with the project have actually taken environmental factors into account. Moreover, his coordination of the various departments involves an assessment of environmental factors.

The mechanics of each agency's assessment may include an impact study. The developer must submit preliminary information. On the basis of this report and advice gathered from other agencies or organizations having an interest therein or relevant expertise, the agency may determine whether to require an impact statement. If one is required, it is usually prepared by the developer. Paper by David Walker, supra, at 12.

Environmental standards are often incorporated into a Franchise Agreement. Where the project is considered a normal project, sec. 32A of the Local Government Act requires a local authority to consider environmental effects.

There are also specific statutes and agencies that individually act to conserve natural resources. The Air Pollution Council separates industries into scheduled (heavy polluters) and nonscheduled (less threatening) industries. The scheduled industries must be licensed by the council.

Queensland Water Conservation Regulations

Water Supply: Generally, the Commissioner of Water Resources (Queens Water Resources Comm.) is responsible for planning and management of present and future water supply, as well as sewerage and drainage. The Queensland Water Act mandates that any diversion of water from watercourses must be authorized by a license.

Interior Aqueous Waste and Sewage Disposal: The Water Quality Council of Queensland is the primary body responsible for regulating the discharge of wastes into any body of water. Waste discharge requires a license pursuant to the Clean Water Act. Also, the Local Authority may control discharges to a sewer system under the Sewerage and Water Supply Act.

The Department of Health should be consulted regarding waste disposal.

Ocean Waste Disposal and Tailings: Ocean dumping of tailings by pipeline off the Queensland coast would probably be subject to regulations by the Queensland Water Quality Council. It would also be regulated by the Great Barrier Reef Marine Park Authority.

The Fisheries Act may intersect with ocean waste disposal where the disposal might affect marine life. The Queensland Fish Management Authority should be contacted for relevant regulations.

Port Construction and Marine Terminal: In addition to the appropriate bodies responsible for land use applications, the Department of Harbours and Marine should be contacted regarding the construction of the marine terminal. The department handles proposals involving coastal engineering or waterfront developments, including storage or stockpiling of materials, and those involving harbor facilities.

The following authorities should also be consulted as their ambits may include a proposed harbor and terminal, depending on terminal location.

The Beach Protection Authority manages protected beach districts; the Director of Queensland Fisheries manages marine parks, which include not only protected waters but adjacent land; and the Queensland Marine Board, which regulates the removal of rock, stone, or any other material from an otherwise unprotected harbor. Also, a license may be required under the Fisheries Act - contact the Director of Queensland Fisheries Service.

Land Conservation Measures

National parks in Queensland are created pursuant to the Forestry Act, 1959, and lie within the jurisdiction of the Minister of Lands, Forestry, National Parks and Wildlife. The Governor may declare Crown lands of scenic, scientific or historic interest to be national parks. These lands are then protected by special zoning. Bates, supra, at 63.

Areas that are of lesser significance may be protected through the designation "Environmental Park" pursuant to the Land Act, 1962, sec. 334A.

Recreational reserves may be declared by the Conservator of Forests pursuant to the Forestry Act, 1959, to preserve state forests. "Wildlife reserves" are created under the Fauna Conservation Act, 1974. They include all national parks, state forests and all islands off the Queensland coast. Additional wildlife sanctuaries may be declared by the governor but interested department heads and private owners and lessees must be consulted. Also, proper notice, consonant with statutory directives, must be given.

C A N A D A

C A N A D A

I. Substantive Introduction

A. Scope of This Case Study and Conclusion

Canada's loose federation presents somewhat of a conflict between the Province of British Columbia and the central government headquartered in Ottawa. The agency most responsible for foreign investment - FIRA - essentially favors a processing plant, but the current Prime Minister of Canada is pledged to abolish it as being too restrictive. The national fisheries laws have been greatly expanded to regulate any activity which might affect the environment of fish in the Pacific drainages and can be expected to heavily affect the location, construction and operation of a processing plant. Such a plant will almost certainly be permitted, if at all, in sparsely-settled areas north of Vancouver Island, where application of local land use and zoning laws is unlikely.

This leaves the legal restrictions from the Province of British Columbia. Between a set of environmental statutes and parts of the provincial Utilities Commission Act, there is sure to be an onerous environmental review roughly akin to an environmental impact assessment and analysis. In addition, official interpretation and application of the provincial waste management act will be critical.

There is finally the potential application of the Federal Environmental Assessment and Review process which may be both nonbinding and with doubtful legal underpinnings, but which has nevertheless been applied in over two dozen federally-proposed or federally-licensed development projects over the last decade, and would likely be applied to a manganese nodule processing plant as well.

B. Summary of Background Factors

1. Geography and Climate

British Columbia (B.C.), a province on the west coast of Canada, is located between 49 and 60 degrees latitude north. The province receives an average of more than 80 inches of rain per year, having an average of 18 to 21 rainy days in January and 10 rainy days in July. (Map 21, p. 45, Atlas of B.C., 1979.)

2. Population and Language

There is adequate population in B.C. (2.5 million) and the language is overwhelmingly English.

3. Government and Legal Systems

The Government of B.C. is parliamentary, on the British model. Though Canada is theoretically federal, the primary authority over resource development is with the provincial and local governments. Stanley M. Makuch, Canadian Municipal and Planning Law (1983), Ch. 5, sec. 3 "The Provincial Role."

The British North America Act, now superseded by the Constitution Act, signalled the formation of Canada in 1867. The Act, under the Doctrine of Ultra Vires, possesses a supremacy over all statutes enacted by the Parliament of Canada, as well as any provincial legislation. (Gall, The Canadian Legal System, 1977.)

Executive power in Canada, with some limited exceptions, is vested on the federal level with the Prime Minister and his cabinet; on the provincial level with the premiers and their cabinets. The House of Commons in Parliament is elected, but members of the Senate are appointed by the Federal Government for life. For decisions by the Federal Government, the Provincial Government has discretion to "reserve" a bill passed by a house. The Federal Government may disallow the reserved provincial act within one year of the reservation. (Crook and Basham, Feb. 1985.) Regulations in Canada come under four levels of government: federal, provincial, regional, and municipal. General power over water, land and waste management rests with the provinces. Boyd & Nassichuck, Fed. Fisheries, Vancouver, August 1984.

4. Ports

B.C. has an abundant number of ports on the west coast and on Vancouver Island, Graham Island, and Moresby Island. Ports deep enough to be used for manganese nodule transport vessels include Nanimo on the east coast of Vancouver Island, Esquimalt at 48 degrees north, 123 degrees west, Prince Rupert, and Vancouver. Deep ports of at least 9 meters include Port Alberni, Port Alice, Powell River, Chemainus, Cowichan Bay, Kitimat, New Westminster, and Ocean Falls. (Ports of the World, 1981, Clyde Port Authority.)

Four representative ports were chosen to determine their distances to three DOMES sites for mining manganese nodules. From the following table, one can see that the distances range from 2400 to 3400 miles.

PORTS/LOCATION

DOMES SITES FOR MINING

PORT ALICE NW Vancouver Island	3234 miles	2772 miles	2376 miles
VANCOUVER SW B.C.	3201 miles	2805 miles	2442 miles
PORT HARDY N Vancouver Island	3234 miles	2838 miles	2640 miles
KITIMAT NW B.C.	3399 miles	2970 miles	2706 miles

*margin of error for distances $\pm$ 200 miles

5. Energy

The major source of electricity in B.C. is hydroelectric power, with major projects on several large rivers (e.g., Peace River, Columbia River) and near Ft. St. John, Kitimat and Revelstoke. There are also supplies of coal and natural gas (in some areas) available in B.C. to supply the needs of a manganese nodule processing plant.

6. Investment Atmosphere

Foreign investment in Canada is regulated nationally by the Foreign Investment Review Act, 1973-74, c. 46, as amended by 1976-77, c. 52, and 1980-81-82-83, c. 107 (hereinafter FIRA). It has been argued that the policy behind FIRA was to find a national identity, to control national affairs, and to obtain maximum benefits from foreign investments. (Turner, 1983.) However, the new federal government has proposed sweeping changes to FIRA which are almost certain to be enacted in mid-1985. (C.J. Byron letter of March 1, 1985.) What follows is a summary of the new provisions contained in Bill C-15 as introduced in December of 1984 (1st session, 33rd Parliament, 33 Eliz. II 1984) together with a comparison to the procedures in effect and for the past few years.

The Investment Canada Bill recognizes that investment is central to economic growth and new employment opportunities and the key to technological advancement. For this reason, investment in Canada by both Canadians and non-Canadians is assumed to be likely to bring benefit to Canada.

The bill establishes a new agency, Investment Canada, with a mandate to encourage and facilitate investment. At the same time it provides for a review of large acquisitions in Canada by non-Canadians to ensure that the assumption of benefit is justified. For small acquisitions and the establishment of new businesses, non-Canadian investors need only notify the agency of their investment intentions.

Part I of the bill (Sections 4-9) describes the responsibilities of the Minister, and thereby of the agency, to carry out activities that encourage investment and ensure benefit. The Minister will:

- encourage business investment by appropriate means;
- assist Canadian businesses to exploit opportunities for investment and technological advancement;
- carry out research and analysis pertaining to domestic and international investment;
- provide investment information services and other investment services to facilitate economic growth in Canada;
- assist in the development of industrial and economic policies that affect investment in Canada;
- ensure that the notification and the review of investments are carried out as required by legislation.

The bill envisages that the Minister will seek the cooperation of other federal government departments, the provinces and the private sector with a view to improving the investment climate and providing services that will assist Canadians to exploit new investment opportunities.

Some transactions by non-Canadians are not intended to be affected by the legislation. These are described at an early stage in the bill (Part II) so that potential investors can readily identify them. They include:

- certain temporary or involuntary acquisitions of control of a Canadian business;
- the acquisition of control of a Canadian business by reason of an amalgamation, a merger, a consolidation or corporate reorganization where the ultimate control of the business remains unchanged;
- acquisition of control of a business of a crown corporation or of a provincial or municipal corporation;
- certain real estate investments;

The bill provides for the Minister, on the basis of information submitted by an individual or entity, to give a written opinion as to whether or not that individual or entity is a Canadian.

"non-Canadian" means an individual, a government or government agency or an entity that is not a Canadian;

"Canadian business" means a business carried on in Canada and having;

- (a) a place of business in Canada
- (b) an individual or individuals in Canada employed or self-employed in connection with the business, and
- (c) assets in Canada used in carrying on the business;

"new Canadian business", in relation to a non-Canadian, means a business not previously carried on in Canada by the non-Canadian and that, at the time of its establishment

- (a) is unrelated to any other business being carried on in Canada by that non-Canadian; or

- (b) is related to another business being carried on in Canada by that non-Canadian but falls within a specific type of business activity related to Canada's cultural heritage or national identity that has been prescribed by the regulations.

Part IV (Sections 14-25) describes the investments that are subject to review and the procedures to be followed.

Investments requiring review are all direct acquisitions of Canadian businesses with assets of \$5M or more, all indirect acquisitions of Canadian businesses with assets of \$50M or more, and indirect acquisitions of Canadian businesses with assets between \$5M and \$50M which represent more than 50 percent of the value of the total international transaction. In addition specific acquisitions or new businesses in designated types of business activities related to Canada's cultural heritage or national identity, which would normally only be notifiable, could be reviewed if the Governor in Council had authorized it in the public interest.

Review Procedure

If an investment is reviewable, an application for review in the form prescribed by regulations is to be filed with the agency prior to the investment taking place (or, in the case of an indirect acquisition within 30 days after the investment).

The agency will then submit the application to the Minister, together with any other information or written undertakings given by the investor and any representations submitted to the agency by a province that is likely to be significantly affected by the investment.

The Minister will then determine whether the investment is likely to be of net benefit to Canada, taking into account the information provided and having regard to the following factors of assessment, where they are relevant:

- (a) The effect of the investment on the level and nature of economic activity in Canada, including the effect on employment, on resource processing, on the utilization of parts, components and services produced in Canada, and on exports from Canada;

- (b) The degree and significance of participation by Canadians in the Canadian business and in any industry in Canada of which it forms a part;
- (c) The effect of the investment on productivity, industrial efficiency, technological development, product innovation and product variety in Canada;
- (d) The effect of the investment on competition within any industry or industries in Canada;
- (e) The compatibility of the investment with national industrial, economic and cultural policies, taking into consideration industrial, economic and cultural policy objectives enunciated by the government or legislature of any province likely to be significantly affected by the investment;
- (f) The contribution of the investment to Canada's ability to compete in world markets.

To ensure prompt review and decision the Act sets certain time limits for the agency and the Minister.

COMPARISON OF THE KEY FEATURES OF THE EXISTING FIR ACT
AND THE CURRENT PROPOSALS FOR THE INVESTMENT CANADA BILL

	<u>FIR Act</u>	<u>Investment Canada Bill</u>
Purpose	Level of foreign control a matter of national concern	Investment by Canadians and Non-Canadians presumed to be of benefit to Canada
Scope of Review	All New Businesses All Direct Acquisitions All Indirect Acquisitions	Not Reviewed. Reviewed if \$5M or more. Reviewed if \$50M or more.
Scope of Notification	No separate provision as all investment reviewed	All new businesses and acquisitions below above thresholds.
Reserve power to review	None required	Any investment regardless of size in culturally sensitive sectors.
Benefit test	Significant benefit to Canada	Net benefit to Canada.
Assessment factors	Impact on: 1. Economic activity 2. Canadian participation 3. Efficiency & technology 4. Competition and 5. Compatibility with federal and provincial economic and industrial policies	Same 5 factors plus: compatibility with cultural policy and effect on international competitiveness.
Review process	Consultation with: -Provinces affected -Departments affected Cabinet - Sensitive cases Decision - Governor in Council Time frame - 60 days with unlimited extension by Government	Same Same Minister 45 days. Extension beyond 75 days only with agreement of investor.

	<u>FIR Act</u>	<u>Investment Canada Bill</u>
Definition of foreign investor	Complex rules based on control in fact with , presumptions biased against investor No incentive to Canadianize	Simpler rules which take account of extent of Canadian ownership and employ more balanced presumptions. Modest incentive to Canadianize.
Penalties	Criminal penalties	Civil penalties except for breach of confidentiality.
Positive Role	None	Specific mandate to:- encourage investment for growth and jobs; - provide information services; - advice on opportunities, contacts.

2. Effect of the proposed thresholds

	<u>FIR Act</u> <u>Reviewed in 1983</u>		<u>Investment Canada Bill</u> <u>Reviewable with thresholds*</u>	
	Number	Value (\$ Millions)	Number (%)	Value (%) (\$Millions)
New Businesses	✓ 442	841	None reviewed.	
Direct Acquisitions	283	2,987	56 (20%)	2,718 (91%)
Indirect Acquisitions	✓ 135	1,519	9 (7%)	830 (55%)
Total	860	5,347	65 (8%)	3,548 (66%)

*Plus some investments in culturally sensitive sectors.

II. Property Law

Foreign ownership of Canadian property is regulated primarily by the federal government because trade and commerce is under federal jurisdiction. Almost every acquisition of a Canadian business is reviewable by the Foreign Investment Review Agency if the assets are over \$250,000. The definition of a Canadian business includes real estate since the FIRA refers to business as any undertaking with a profit motive involved. The Act is particularly difficult for foreign real estate investment because the "significant benefit" requirement must be met. However, this strict standard may be relaxed and real estate transactions may be approved if they do not have a detrimental effect on Canadian business. (Richards, M.L., "Real Estate Investments in Quebec," 10 Real Prop. Prob. and Trust J. 719-724.)

The provinces also regulate foreign ownership since property, resources other than anadromous fish and civil rights are under their jurisdiction. British Columbia has a further restriction on foreign ownership that no Crown grants of land can be made to nonresidents or noncitizens of Canada.

B.C. has a Land Title Act which approximates the Torrens system in the U.S. (2 Sup. Ct. L. Rev. (Canada) 279 (1981).) Property interests, such as easements for access to land, must be registered. A surface lease must be accompanied by a registrable plan which shows, for example, the processing plant and rail spur locations. (Richards, p. 4.) Careful attention should be given to the form of the lease agreement to ensure that it is registrable.

B.C.'s Land Act deals with interests in provincial Crown land. Section 35 covers leases and section 36 covers licenses. Each has a provision which allows the minister to include any terms and reservations he considers advisable. (Wildsmith, p. 171.)

The Residential Tenancy Act, c. 365, has principles based on contract law rather than laws of landlord and tenant. (Martindale-Hubble, 1983, Vol. VIII, p. 3171.) The Human Rights Code, c. 186, prohibits discrimination in leasing on grounds of sex, race, marital status, religion, color, ancestry, or place of origin. The Commercial Tenancy Act, c. 54, requires that leases of three years or more be in writing signed by the lessor, and strongly recommends that any such lease be registered. An occupier must exercise reasonable care for the safety of people and property on the premises. A breach of this duty results in tort liability under the Occupier's Liability Act, c. 303.

The Heritage Conservation Act is administered by the Heritage Conservation Branch of the Ministry of Recreation and Conservation. (B.C. Ministry of Energy, Mines, and Petroleum Resources, 1978, p. 219.) Because "heritage" is defined as anything historic, architectural, archaeological, or of scenic significance, archaeological sites are fully protected under the Act. Before protection is conferred, historical sites must be designated as such either by Order of Council (provincial) or Order of Municipal Council (local). The Heritage Conservation Act has not been used yet to protect archaeological sites from mining projects. Archaeologists have been involved, however, with the Environmental Impact Assessments for proposed mining projects.

The federal government has a Department of Labour which focuses on worker safety. (Doern, 1977, p. 34.) The department is strongly linked with OSHA in the United States. 50 to 60 people are employed by the department on the federal level while 1300 provincial government employees have part-time contracts to act as federal inspectors.

III. Applicable Land Use Laws

Most Canadian experts agree that the principal laws applicable to the siting of a manganese nodule plant in British Columbia will be the federal fisheries and environmental assessment laws discussed in Part IV and the provincial mining and environmental assessment sections of various provincial statutes discussed in Part V. This is abundantly clear from the apt and timely hypothetical used by the October 1983 Environmental Law and Practice Seminar held under the auspices of the Continuing Legal Education Society of British Columbia in October of 1983, which is set out, with comments, as a fitting conclusion to this case study. What follows is a brief summary of land use planning and controls which might nevertheless have some relevance to aspects of the processing plant and its approval process, however unlikely it is that such a plant would be sited within the boundaries of a planned or zoned unit of local government with power to substantially affect its location.

A. Planning

Planning is permitted, but not required, on both provincial and local levels. B.C.'s local government planning provisions are set out in the Municipal Act.

There are two kinds of official plans for B.C. - official community plans which apply to municipalities and official settlement plans which apply to settled non-municipal areas. Official community plans are enacted by the municipal councils while official settlement plans are enacted by regional district boards.

Both community and settlement plans express policy for the use of land and the pattern of subdivision of land. Plans may be expressed in maps, plans, reports, or some combination of each method. When designated by bylaw the plan becomes an Official Plan. Plans are adopted by bylaw and contain broad socio-economic and environmental objectives to be achieved by implementation of the plan. A statement of the policies of the local government on the general form and character of future land use is included for the affected area.

Official settlement (but not community) plans need Provincial approval. Municipal Act, secs. 809(5) and 814(2). The Municipal council prepares the community or municipal plan. The plans need not be based on studies or surveys. The council must hear and consider all comments by persons who feel their interest in property is affected before adopting the plan. A municipal plan is adopted by bylaw passed by simple majority of the council. The plan, although not usually located there, can be included in the bylaw itself. Similarly, settlement plans may be designated "official" by bylaw passed by a simple majority of directors of the Regional Board who are eligible to vote. (Municipal Act 805(4)).

The Minister of Municipal Affairs will furnish advice to municipalities on request, and may object to a bylaw or plan. (Rodgers, p. 11.) If the municipality does not alter an objected to plan within 90 days, the minister can order alteration. His decision can be appealed to the cabinet.

On the municipal level, the council is solely responsible for preparing and adopting the plans. (Rodgers, pp. 50, 54.) An advisory planning commission may be appointed. The Municipal Act leaves the establishment, composition, and functions of the planning commission entirely to the council. To establish the planning commission, a municipal council must pass an establishing bylaw with a two-thirds vote. Having a majority of council members on the commission is not banned by statute. Municipal Act, sec. 715.

When plans are adopted, the issue of necessary conformance with regulatory bylaws arises.

An official Community or Settlement Plan, which reflects the policy of the local municipality, is also limited in scope. Local plans are set out by means of maps, charts, or reports with content restricted to policy reflecting land use and land subdivision. These plans bind a council or board, but not an individual.

Any official plan needs a zoning bylaw to give it legal effect. Development which contravenes the plan cannot be prevented without a bylaw to aid in enforcement. Plans are clearly distinguished from bylaws; an enactment in the form of a bylaw which was general in nature, prospective in application, and affected future development is considered a plan and not enforceable as a bylaw. Rodgers, p. 45; see Capozzi Enterprises Ltd. v. Central Okanagan, 1978, 94 DLR 3d 80 (BCSC).

Plans are implemented by bylaw, such as zoning and subdivision regulations. Councils and boards are enjoined from undertaking any work which conflicts with an Official Community or Settlement Plan. A zoning bylaw must conform to the Official Community or the Official Settlement Plan. Rodgers, 65-71, and Erik Karlsen, Executive Director, Development Services Branch, Ministry of Municipal Affairs, letter/March 6, 1985.

However, although zoning bylaws must conform to the plan, this does not empower the "council to impair, abrogate, or otherwise affect the rights to which an owner is otherwise entitled." Municipal Act. Section 712. Rodgers, p. 67.

B. Zoning

1. The Basic Zoning Bylaw

While official plans have legal effect, it is the zoning (and subdivision - discussed in "C" infra) bylaws in conformity with the plans which restrict the individual landowner in the legal sense. Official plans are binding on the municipal council or regional board. Municipal Act, sec. 712, 809. Accordingly, a zoning bylaw must conform to the respective official community or settlement plan.

The policies behind zoning in B.C. are to prevent overcrowding and preserve amenities in a zone; to promote health, safety, convenience, and welfare, and; to secure adequate light, air, and access. (Rodgers, p. 122.) The modern zoning bylaw is a comprehensive document including maps and a corresponding text. A breach of a zoning bylaw does not affect the validity of title. In B.C. a municipality has power to enact zoning bylaws independent of a plan, but if a plan exists, the bylaws must conform to the plan.

The extent to which authorities may zone is delegated by statute. The only body which gives statutory guidance to municipal councils in B.C. is the B.C. Legislature. (Rodgers, p. 141.) The size, shape, and siting of buildings may be regulated. The power to regulate includes the power to prohibit but, as with all council actions, the council must act impartially and in good faith. Id., p. 142. A bylaw passed as a holding bylaw to prevent an owner from any use of his land was held to have been passed in bad faith and was declared invalid. Id.

The zoning bylaws designate general zones, usually commercial, residential, and industrial. Density, lot size, allowable density of housing, and development or performance standards such as street setbacks and yard sizes are also designated. (Rodgers, p. 159.) The B.C. Minister of Municipal Affairs can direct amendment if the bylaw is contrary to the public interest of the province, and the council must amend the zoning within 90 days of receipt of such direction. (Rodgers, p. 170.)

Zoning bylaws must also be consistent with provincial enactments and statutes. A recent case held that a bylaw prohibiting industrial waste disposal could not derogate from rights granted under the Environmental Protection Act by certificate of approval to operate a waste disposal site. See Re Ridge Landfill and Harwich, 1980, 31 OR 2d 366, 13 MPLR 37, 118 DLR 3d 729.

Any bylaw which conflicts with the Agriculture Land Commission Act is suspended and has no effect. The Agriculture Land Commission Act, SBC 1977, c. 73, sec. 1, set up the Agriculture Land Commission to preserve agricultural land. Once land is designated Agricultural Reserve, it cannot be used for nonagricultural purposes without prior review by various government agencies. (Swaigen, 12 Ottawa L. Rev. 439, 1980.) (Rodgers, p. 142.)

B.C. municipal enactments do not bind the Crown. If the federal government wishes to install a public service to carry out a federal project in the region, it could require the local government to amend its development plan, but prior public consultation is needed before such an order can be given. Id., p. 146. The Navigable Waters Protection Act, RSBC 1970, c. N-19, does not relate to land use so municipal zoning can require that land be left as open space. Id. The Harbour Commissioners, authorized by federal statute, can enact bylaw affecting private land owners as long as the purpose is to aid in navigation and shipping activities. Id. Provincial powers may also regulate harbors but if a conflict exists the federal power is paramount. Id. p. 147.

C. Subdivisions

B.C.'s subdivision regulations apply to residential, commercial, and industrial developments which seek to divide legal parcels of land into smaller parcels or consolidate two or more parcels of land into one. Prior to subdividing or consolidating, a plan of subdivision must be deposited in the Land Title Office. The policies behind subdivision control are to adequately service building sites and prevent an undue increase in the tax burden on local residents. The right to subdivide is recognized and any restriction in derogation of this right must be supported by statutory authority. *Id.*, p. 76. B.C. allows replatting for redesigning a poorly planned subdivision. A bylaw for replatting was passed and later held valid by a court without provision for notice or opportunity to be heard to affected owners. See Timmerman v. Langley, 1975, 1 WWR 7 (B.C.).

Municipal councils have power to pass bylaws for the regulation of subdivisions (Rodgers, p. 86), but the Lt. Governor in Council may intervene when a plan is against the public interest and order the Registrar not to accept the plan for recordings. *Id.*, p. 78. But councils lack power to approve subdivisions, which is the province of an approving officer whose authority is beyond council reach. Erik Karlsen, Executive Director, Development Services Branch, Ministry of Municipal Affairs, letter of March 6, 1985. An approving officer reviews the submitted subdivision plans. *Id.*, p. 78. In municipal areas the approving officer is usually an engineer or chief planning officer. *Id.* In rural areas he is either the Deputy Minister of Transportation and Highways or a person appointed by the Lt. Governor in Council.

In a municipality the approving officer must be a municipal employee (and, in unorganized areas, an employee of the Ministry of Transportation and Highways), he is given little flexibility in the subdivision control process and is expected by the legislature to exercise his discretion independent of municipal council or regional district board control.

In applying for approval a subdivider tenders his plans to the municipal clerk, after which the aforementioned approving officer must review and decide whether to approve or reject the plans. He must give due regard to an Official Community Plan, comply with the Land Title Act, the Municipal Act, and relevant bylaws. He may also refuse approval of the plan for failure to comply with all regulations for subdivision plans, adversely affecting the environment, opposing public interest, or failure to conform to regional bylaws. (Rodgers, p. 106, supp. p. 24.)

Finally, the approving officer may refuse to allow the subdivision if he thinks it would be too expensive for the municipality. Municipal Act, sec. 729(4).

In summary, the approving officer may reject a subdivision plan for the following reasons:

1. the subdivision plan does not conform to:
 - a. all applicable provisions of the Municipal Act
 - b. the respective municipal or regional bylaws regulating zoning and subdivisions
 - c. the Official Settlement Plan
2. the plan entails excessive costs to the municipality in providing public utilities or other services
3. the subdivision plan is against the public interest.

Once a subdivision plan is approved and registered, the developer is entitled to building permits so long as he complies with the bylaws.

B.C. local governments may use subdivision bylaws to require sharing in the costs not only of water mains, (Rodgers, p. 114.1), but also for sewage collection, and drainage collection. Municipal Act, sec. 729(1). Land for park use can also be required, so long as it does not exceed 5 percent of the land being developed.

While subdivision bylaws have been traditionally recognized as separate from zoning bylaws on the ground that the former do not regulate the use of land, this distinction is blurred by the development permit system discussed in part D, below.

D. The New Development Permit System

The legislature introduced a development permit system in 1977. Development control permits allow variance in zoning, and servicing conditions in subdivision control, bylaws. Municipal Act, sec. 717(2). The development permit system is established locally by bylaw. A development permit may require or authorize one or more of 11 different restrictive requirements. They are different from zoning controls because in addition to modifying regular zoning requirements, they include the authority for requiring certain actions, such as landscaping and providing

playgrounds. They are (a) the regulation of dimensions and siting of buildings and structures on land, and (b) regulation of siting and design of parking and loading facilities. The council may designate development permit areas when in the council's opinion special conditions prevail in the physical environment or in design or siting considerations. In such areas, a development permit must be obtained (usually from the local director of planning) and the council may impose restrictions on the exterior finish of buildings (other than residential buildings containing less than three dwelling units) to gain some control of the aesthetic design of a building. Throughout Municipal Act Section 717 the word "development" is not defined. *Id.*, sec. 717(4). While a development permit may be otherwise in conflict with zoning or subdivision control bylaws, it may not be in conflict with any other municipal bylaw, such as a sign bylaw. The development permit itself cannot set out the variations or supplements to zoning and subdivision control bylaws; there must be similar development permit provisions in the zoning bylaw itself. Rodenbush v. North Cowichan, 1980, held that a municipality must regulate development through bylaws and not solely by the way of development permits which are obviously subject to the changing attitudes of the municipal council. There is some indication this decision is largely ignored, however.

A landowner may apply for a voluntary development permit to vary the facility or design requirements of existing bylaws. If land is in an area designated by council to be a development permit area then a development permit must be obtained prior to a building permit.

A valid development permit will continue in effect although contrary to a newly enacted bylaw.

IV. Environmental Law

A. Federal Environmental Law

The federal Department of the Environment is composed of six services to meet its mandate of preservation and enhancement of natural and renewable resources. These services include: Parks Canada, Canadian Forestry Service, Atmospheric Environment Service, Environmental Conservation Service, and Environmental Protection Service (EPS). The EPS is concerned with air and water pollution, solid waste management, resource and energy conservation, and environmental emergencies. The EPS is concerned with air and water pollution, solid waste management, resource and energy conservation, and environmental emergencies. The EPS administers the Clean Air Act, the Environmental Contaminants Act,

and the Ocean Dumping Control Act, and Section 33 (water pollution) of the Fisheries Act. The Environmental Impact Control Directorate of the EPS has responsibility for (1) environmental contamination, (2) ecological impact control, (3) environmental emergencies, and (4) waste management. The Water Pollution Control Directorate has responsibility for water pollution control.

1. Fisheries Act

The Fisheries Act (RSC 1970, c. F-14) was designed to protect fish and their habitat, but its reach has been administratively extended to include pollution of any fish habitat, which means most inland and coastal waters. It is the principal federal environmental law applicable to major development like a nodules plant. (Rodney Snow, attorney, Vancouver, August 1984; John Wiebe, Environment Canada, Vancouver, August 1984.)

Habitats include areas where fish spawn, feed, rear young, and migrate. The federal Environmental Protection Service (hereinafter EPS) administers the Act in relation to the ocean and inland waters where salmon are found. For inland waters devoid of salmon or smelt, the Provincial Ministry of Environment has been delegated power to control water pollution. (Doing Business in B.C., #4 Environmental Management.) When the livelihood of migratory birds and game inhabiting Canada is threatened, the federal government cabinet has the power to regulate hunting as well as the use of areas where they breed and nest. RSC 1952, c. 179, sec. 4.

Section 33 of the Fisheries Act controls pollution of fishing grounds, defined as "any water where fishing is carried on...." The Act imposes fines in strict liability for depositing deleterious substances ranging from \$5,000 to \$50,000 for the first offense and \$10,000 to \$100,000 for each subsequent offense. Civil liability may also be incurred by the polluting offender. The Governor in Council may prescribe regulations for conditions or circumstances under which deleterious substances may be deposited in fishing grounds (*id.*, sec. 13(e)). Alternatively, the Governor in Council can designate persons who may authorize the deposit of such substances in the absence of any other authority (*id.*, sec. 13(f)). If a person is given authority to supervise dumping, the Minister of Fisheries can require monitoring and water analysis to be reported to him directly. Additionally, the Minister may require potential polluters to provide "complete" information on any activities which are likely to alter or disrupt fish habitat. *Id.*, sec. 33.1(1). The minister may, by order, require modifications or restrictions in

dumping plans upon consultation with the affected province and appropriate federal agencies. The Minister may appoint an inspector who has the power (as do other fishery officers) to enter on any commercial premises upon reasonable suspicion of unauthorized pollution activities or for "any purpose related to the enforcement of this section." Id., sec. 33.1(3). The Governor in Council clearly has power to make regulations in regard to pollution of "any waters frequented by fish." Id., sec. 34(f).

The Act was "expanded," apparently, because there is no clear constitutional authority to undertake clean water regulation at the federal level. Franson interview, Vancouver, Aug. 1984. There are three volumes of cases which have been prosecuted under the Act since 1970. Fisheries Pollution Reports (Volumes 1-3) Case Law: Prosecutions Under The Pollution Control Provisions of The Fisheries Act (John E. MacLatchy and Michael Hardin, eds.) Environment Canada, 1980.

An excellent example of the use of the Fisheries Act to control mineral processing is the promulgation of Alice Arm Tailings Deposit Regulations under the Act of the AMAX Kitsault Molybdenum Mine at Alice Arm in British Columbia. Alice Arm Tailings Deposit Regulations, SOR/79-345, 10 April 1979, as published in the Canada Gazette Part II Vol. 113, No. 8 5/4/79. Essentially the regulations govern the "deposit" tailings from the mine's milling operations. They may be deposited only in certain locations and in certain concentrations, and only after prescribed treatment. The basis of the regulations are that portion of the Fisheries Act which prohibits the discharge of deleterious subjects into the waters of Canada in such a fashion as to endanger the environment of fish, as described above. See, Burling, McInerny and Oldham, "A Technical Assessment of the AMAX/Kitsault Molybdenum Mine Tailings Discharge to Alice Arm, British Columbia," July 24, 1981, updated July 31, 1983, prepared for the national Minister of Fisheries and Oceans.

More general regulations application to metal mining liquid effluent generally were promulgated under the authority of the Fisheries Act in 1977. Metal Mining Effluent Regulations, P.C. 1977-388, 24 February 1977, SOR 77-178, as published in Canada Gazette Part II Vol. 111 No. 5, 9/3/77. The regulations provide for monitoring and reporting, and contain detailed schedules and tables for various pollutants, as well as sample report formats and an Environmental Code of Practice for Mines. Several officials suggested that the regulations would be applicable to a processing plant, regardless of where the raw materials - in our case, manganese nodules - originated, given the purpose of the Act and regulations to protect fish habitat.

Interview with Nassichuck and Boyd in Vancouver, August 1984; interview with McLatchy in Ottawa, August 1984. According to industry sources, the pollution levels set in the regulations are so low that only by getting a declaration of an "impoundment" by the Minister can a mining company economically discharge tailings into Canadian waters. Hardin interview, Vancouver, August 1984.

2. Federal Environmental Assessment Review

The second most important federal "control" is the environmental assessment performed on large projects - such as a manganese nodule processing plant - by the Federal Environmental Assessment Review Office (FEARO), which may be utilized whenever (like U.S. NEPA) the federal government of Canada is somehow involved. While Canadian lawyers stress the assessment which results from the process is a policy document only (Snow, Vancouver, Aug. 1984; Hardin, Vancouver, Aug. 1984). (Indeed, one scholar/expert is convinced there is no legal authority for the FEARO assessment process. Interview/Professor Robert Franson, UBC, Vancouver, August 1984.) Moreover, the process has not yet been applied to a processing plant like one for manganese nodules, in B.C. (Basham and Crook, Feb. 1985.) FEARO officials note that the "information only" process and assessment generally produces a lot of publicity and public pressure on Minister with power to block a project. There have been 24 such assessments since 1975, but only three have resulted in the termination of the proposed project. The rest were recommended to be allowed to proceed, upon various conditions. David Marshall, FEARO, Vancouver, Aug. 1984.

The initial determination that a project is likely to have environmental significance is made within the responsible federal department or ministry, but once that determination is made, it must be referred to the Minister for the Environment for a formal assessment and review:

- (1) The head of FEARO then receives the referral from the Environment Minister.
- (2) The Minister names a three- to seven-person hearing panel, which is supposed to be professionally and geographically diverse.
- (3) FEARO staff assists with the preparation of written guidelines for the preparation of an Environmental Impact Statement (EIS).

- (4) The project proponent submits a draft EIS.
- (5) The EIS is placed "out" for public review, while the panel reviews it for sufficiency under its project-specific guidelines. At this point, the panel either issues a "deficiency statement" and requests more information, or proceeds with hearings.
- (6) The panel then holds both informal "public participation" community hearings and more structured general hearings, complete with formal agendas, witnesses and transcripts.
- (7) The panel then meets to decide upon and make its report to the Environment Minister.
- (8) The Environment Minister then confers with the Minister who referred it to him in the first place to decide whether to accept the panel recommendations and what action, if any, to take. Disagreement is resolved at the federal cabinet level.

For a good example of the law in action, see Beaufort Sea Hydrocarbon Production and Transportation, Final Report of the Environmental Assessment Panel, July 1984. It is #25 of a series dating back to 1975. "Environmental Assessment and Review Process Guidelines Order," P.C. 1984-2132, 21 June, 1984; interview/David Marshall, FEARO, Vancouver, Aug. 1984.

The question of fairness and "judicialization" in the above assessment process is currently a matter for review, but it does not appear that changes will result. Canadian Institute of Resources Law, Fairness In Environmental and Social Impact Assessment Processes, Seminar Proceedings, February 1983; R. Paisley, "Reflections Upon the Increasing "Judicialization" of Environmental Decisionmaking in Canada" unpublished paper, 1984. Finally, as noted earlier, there is some question over the legal authority for FEARO assessments (Franson interview in Vancouver, supra) though the federal government has recently issued an

"official" order ostensibly under the Government Organization Act of 1979 which confers some semblance of legality on the process. Env. Assess. and Rev. Process Guidelines Order, P.C. 1984-2132, 21 June 1984.

3. Miscellaneous Federal Law

To preserve the navigability of waterways, the National Harbours Board Act allows Ports Canada (formerly the National Harbours Board) to regulate the use of and dumping in harbors, including Vancouver and Prince Rupert. RSC 1952, c. 187. Additionally, the Navigable Waters Protection Act protects the public right of navigation in navigable waters. RSC 1952, c. 193, sec. 18. While the Act is administered by the Minister of Transport, many federal agencies review a project before approval. (Doing Business in B.C., #4 Environmental Management.) This Act is usually applied to port development on the navigable ocean rather than inland waters, however. (Basham and Crook, Feb. 1985.)

The Boundary Waters Treaty of 1909 set up an International Joint Commission comprised of three Canadian and three American representatives and requires reasonable use of water. (Canadian Industries, Water, p. IJC 1.) Waste discharged into the rivers must not cause injury to health, property, or desirable aquatic life in the other country.

The Environmental Contaminants Act of 1976 regulates substances identified as contaminants. The Act gives power to the federal government to gather information on any substances that may be polluting the environment regardless of source or use. Appropriate controls over the contaminating substance may be applied through federal regulations if other federal or provincial legislative authority does not exist. The Act is primarily intended to reinforce existing authority. Its control provisions are triggered when the federal government has a firm reason to believe a dangerous situation cannot be remedied in any other way.

Several sections of the Act are intended to alert federal officials of commercially important chemicals which may pose a danger to human health or the environment. Industry may be required to submit data on manufacture or import of chemicals in a quantity greater than 500 kg per year, production processes, impurities and losses to the environment. Industry may also be required to conduct tests on the physiochemical and biological properties of potentially dangerous substances to determine if and

how they are dangerous. If the Minister of Environment and Minister of National Health and Welfare are satisfied that a substance poses a significant threat then the control mechanisms of the Act are triggered. Accordingly, the government has comprehensive powers to restrict or prohibit (1) the release of a contaminant into the environment, (2) the commercial use of that substance, and (3) the incorporation of the substance in a manufactured product. The Act binds the Crown on both federal and provincial levels.

The Act is administered by two federal departments: the Department of Environment and the Department of National Health and Welfare. The Health Protection Branch of the Department of National Health and Welfare researches and advises for administration of both the Clean Air Act and the Environmental Contaminants Act. (Doern, 1977, p. 35.) The Clean Air Act is administered by the EPS with an Air Pollution Control Directorate and five regional offices of EPS.

The Clean Air Act provides federal control over air pollution activities with three main objectives. The first and foremost is to protect human health. To this end, the emission of hazardous pollutants (e.g., lead, mercury, asbestos, vinyl chloride) is restricted. The second objective is to promote uniform application of the Act across Canada. Accordingly, industrial sector guidelines are aimed at the prevention of "pollution havens." The third objective recognizes the necessity for joint cooperative effort with provincial control of air pollution. To this end the Act allows the establishment of arrangements with individual provinces for implementation of Clean Air regulations. Section 8 of the Act promulgates national emission guidelines based upon best operating practices and best practicable technology. National emission guidelines developed for nonferrous smelting industry should now be available. However, this Act rarely applies in B.C. on other than federal land, emissions being primarily governed by the B.C. Waste Management Act. (Crook and Basham, February 1985.)

Penalties can go as high as \$200,000 for contravening national emission standards and up to \$5,000 per day for contravening other requirements. Id., at pp. 36-37.

Air pollution can also be regulated through enforcement of the Criminal Code, the Shipping Act, and the Railway Act. (Canadian Industries, Vol. 1, Air.) The Criminal Code imposes a penalty and liability for creating a common (public) nuisance, while both the Shipping Act and the Railway Act set emission standards for ships and trains, respectively.

DIAGRAM I
Implementation of OIC 908 (Fraser Estuary)
and OIC 3339 (Cowichan Estuary)

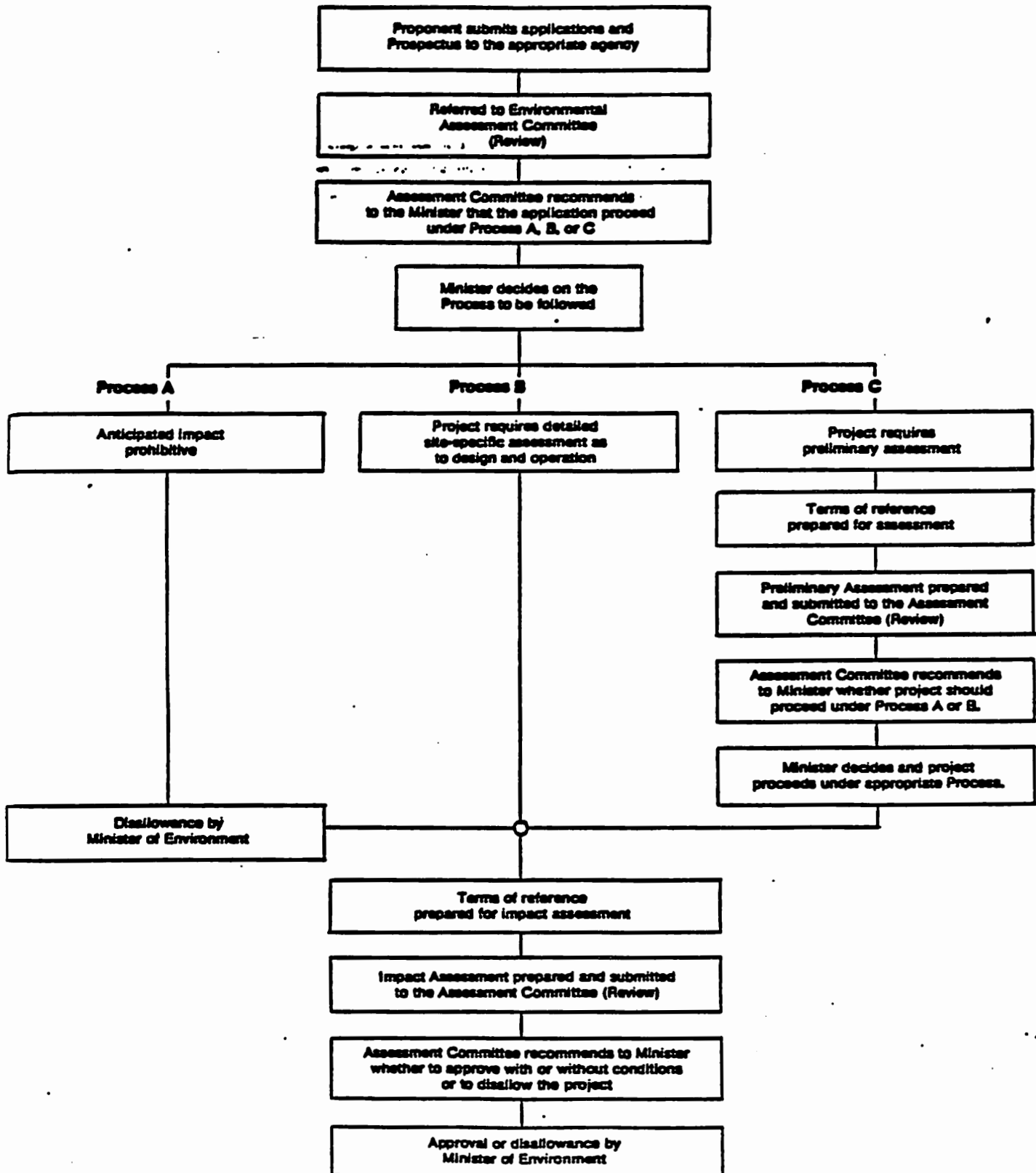
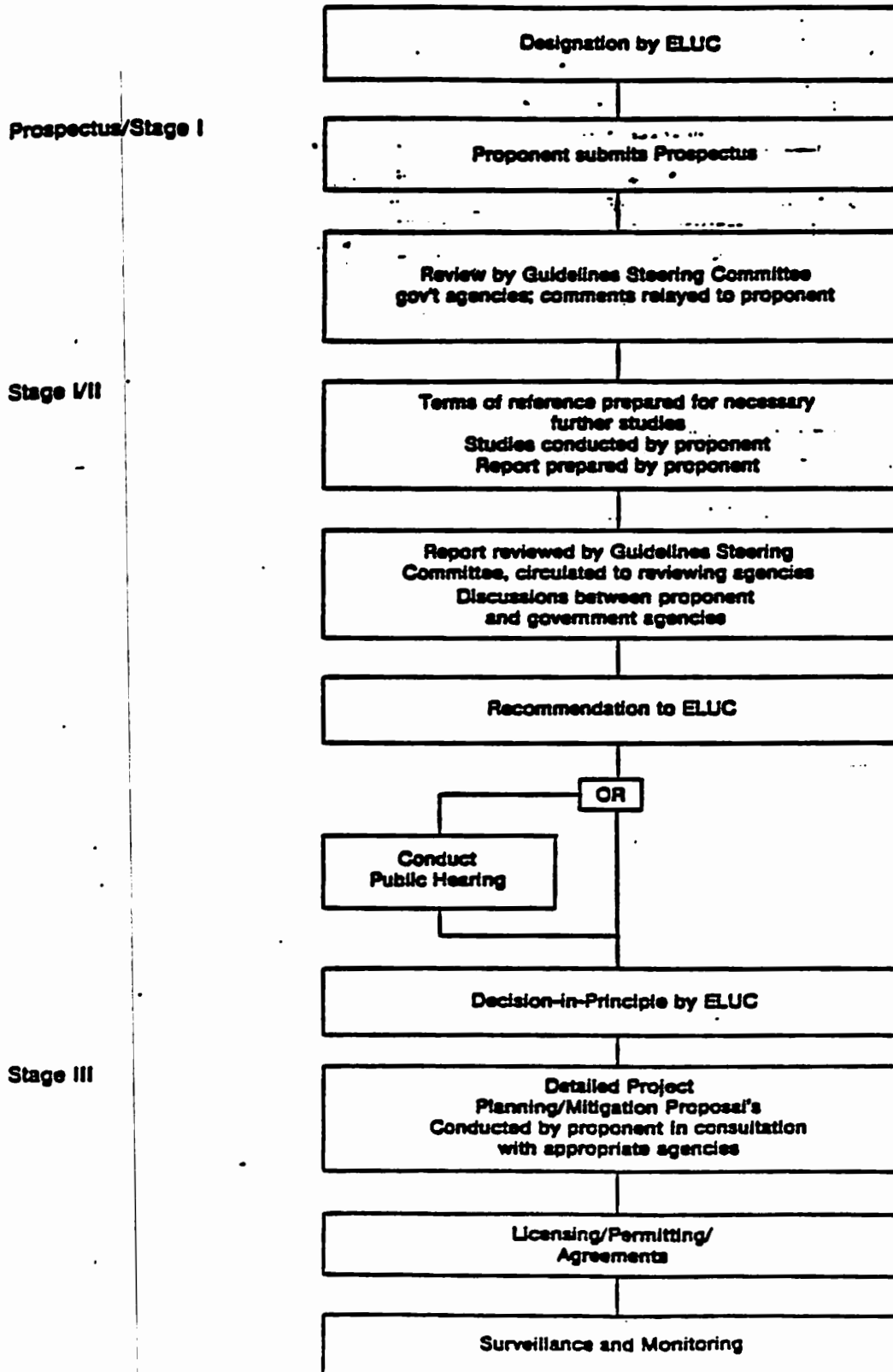


DIAGRAM 2
Administration of Project Assessments
under the Guidelines Process



ii) Procedures for two Orders-in-Council under the *Environment and Land Use Act*

(See Diagram 1)

- The Environmental Assessment Committee is chaired by the Ministry of Environment. A separate Committee is convened for each proposal, composed of persons with required expertise to assess the proposal's impact.
- Three processes may be followed for reviewing a proposal, ranging from disallowance to a staged review of alternatives followed by site-specific EIA.
- EIA terms of reference are prepared by the Assessment Committee, often in consultation with the proponent. The Assessment Committee maintains liaison with the proponent while the EIA is being prepared.
- If a submitted EIA acceptably fulfills the terms of reference, the Assessment Committee prepares its report containing recommendations to the Minister of Environment. The Minister renders a decision and the proponent is informed in writing.
- Usually the Deputy Minister acts on behalf of the Minister. Most agencies whose subsequent approval may be required have a representative on the Assessment Committee. Although formally, such Committee members are not to advise on their respective agency's position, the agency is informed of decisions under the O+C through its member. For minor activities subject to O+C (e.g. replacing pilings), an EIA will not be required of the proponent and environmental assessment and recommendations are prepared by the Assessment Committee.

iii) ELUC Guideline Procedures

(See Diagram 2)

- Following agency review of prospectus coordinated by Guidelines Steering Committee, the proponent is informed whether or not further study is required before he may proceed.
- If further study is required, the proponent addresses alternatives in Stage I of the particular Guideline Process. The proponent must submit to the Guidelines Steering Committee an assessment which includes both informa-

tion on the project's potential environmental impact, and engineering and cost data to determine the preferred alternative. Initial plans for mitigating measures, engineering design and public consultation programs, may also be included. Throughout the study in Stage I there may be liaison between the proponent, his consultant, the Guidelines Steering Committee, and the involved B.C. agencies.

- Consultation between the proponent/his consultant and the Guidelines Steering Committee leads to an agreement on the terms of reference for the assessment of the preferred alternative to be addressed in the Stage II Report, the design stage.
- The Stage II Report contains a detailed assessment of environmental, social and economic impacts of the project and the development plan.
- The Guidelines Steering Committee recommends to ELUC either:
 - 1) a decision-in-principle respecting the project's environmental and land use considerations along with conditions recommended for further assessment (including plans for compensation and mitigation if appropriate); or
 - 2) ELUC holding a public hearing prior to making a decision-in-principle.
- The chairman of ELUC sends a letter which sets forth the reasons for the decision and outlining any conditions to the proponent and those involved in the project assessment.
- If the decision-in-principle is favourable, the proponent may proceed to Permitting and Final Approvals Stage (subject to conditions established by ELUC).
- The Guidelines Steering Committee will monitor the Permitting and Final Approval Stage and report to ELUC (or other Cabinet committees as appropriate) on areas for which policy direction is required.

The EPS also administers the Ocean Dumping Control Act. This Act regulates ocean disposal of any substance from any man-made object. A permit is required for disposal at designated ocean sites. (Doing Business in B.C., #4.)

B. Environmental Law in British Columbia

While approximately forty-five provincial statutes make some reference to environmental or social impact, the principal ones are the Environment Management Act, the Environment and Land Use Act, the Utilities Commission Act, the Water Act, the Waste Management Act, the Pollution Control Act and the Ministry of Forests Act. Not all of these are necessarily applicable to the citing of a manganese nodule processing plant on the B.C. coast. Canadian Council of Resources and Environmental Ministers, Environmental Assessment in Canada, 1982 Summary of Current Practice, (William J. Couch, editor), January 1982.

1. The Environmental and Land Use Act (RSB 1979)

The ELUA's principal contribution to environmental protection is the establishment of the Environment and Land Use Committee (ELUC) of the B.C. cabinet, to establish and recommend programs to foster public concern and awareness of the environment, minimize and prevent its despoilation by resource and land development, and to report to the cabinet as a whole. Upon the advice of ELUC, the cabinet can issue orders in council and regulations to deal with environmental matters, including the mandatory preparation of environmental impact assessment and requiring the Minister of the Environment to approve certain projects. ELUC has already issued guidelines for developers requiring them to coordinate their project planning with assessment of environmental and social impacts, such that this might satisfy the requirements of other statutes with assessment requirements as well. These guidelines, issued for particular types or "sectors" of projects - hence called Sector Guidelines - already deal with certain kinds of mineral extraction and development, though probably not with manganese processing alone. The process is set out on the facing diagram.

2. The Environmental Management Act of 1981

The Environmental Management Act, SBC 1981, c. 14, is administered by the Ministry of Environment and provides for planning, policymaking, public education activities, and protection for the environment. The Minister has the duty to formulate environmental plans for specific areas of B.C. with respect to water, fisheries, wildlife, and air management. To assess environmental impact and prevent environmental damage, the Minister of Environment also has power to require an environmental impact assessment for potentially detrimental activities.

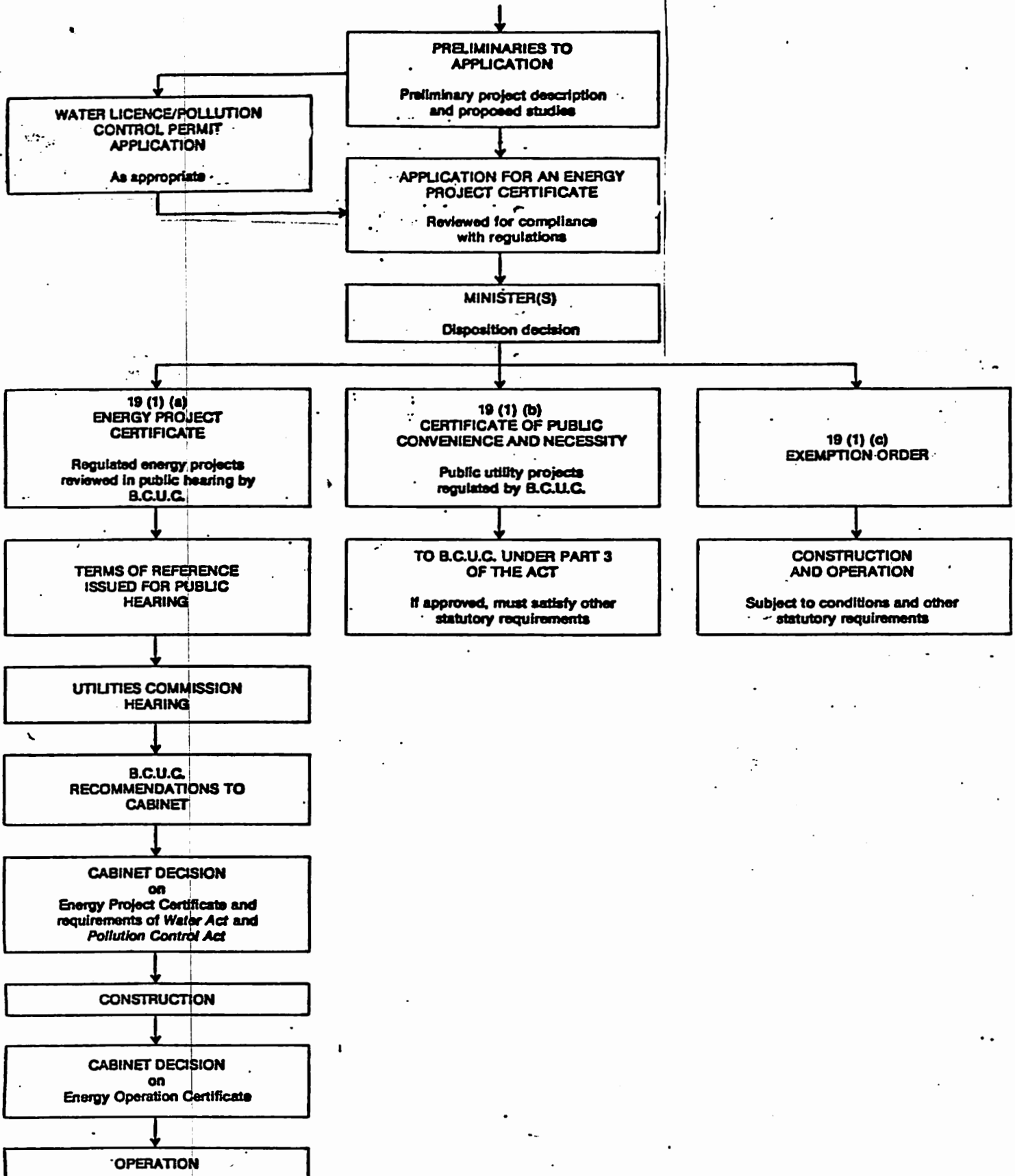
An EIS is triggered under the Act when activities which may have an adverse environmental impact are not adequately covered by other various environmental assessment procedures. Normally, the various procedures in place for assembling industrial and government projects will satisfy the interest of the Ministry of Environment at the outset. However, when activities are not completely covered by other environmental studies then Section 3 of the Act applies and an EIS may be required under the guidelines and regulations of the Ministry of Environment. (Synopsis of Environment Management Act April 1981, Province of B.C. Ministry of Environment.) While the Act empowers the Minister or Lieutenant Governor in Council to issue an Environment Protection Order, it is not clear what legal effect an adverse EIS from an industrial activity carries. Id., sec. 3. This is the only statute noting a direct reference to an EIS as a requirement for activities which may have adverse environmental impacts.

The Minister and Lieutenant Governor in Council have power to issue an injunction or modify operational activities as an environmental protection order. The interim order must state the factual basis but may be made without a hearing; the order cannot be extended or renewed beyond 15 days. If the Minister enjoins an activity, it must be affirmed within fifteen days by the Lieutenant Governor. The Lt. Governor in Council may direct the Minister to prepare an environmental management plan for the impacted area. The management plan may be approved by the Lt. Governor with or without modifications. Id., sec. 4.

If the Minister considers that an environmental emergency exists, he may declare an environmental emergency. This allows him to use land and labor to diminish the threat to the environment. Id., sec. 5. Compensation for labor or services is determined by the Lt. Governor, while compensation for facilities and property will be fixed through the Arbitration Act. The Minister may also spend in response to an environmental emergency, and if documented, can recover costs from the responsible party. Id., sec. 6.

If the Minister desires an inquiry into an activity, he may hold a private inquiry. Id., sec. 7. A minister or a properly designated person may enter private land (except a private residence) to administer the Act. Id., sec. 8.

DIAGRAM 3
Energy Project Review
Certification Procedures



(iv) Energy Project Review Procedures — Utilities Commission Act

(See Diagram 3)

- A "regulated project", as defined under the Act, must receive an Energy Project Certificate before construction and an Energy Project Operation Certificate before operation. Application requirements are governed by regulation.
- A proponent contacts the Energy Project Coordinating Committee (EPCC) and provides a prospectus. EPCC refers prospectus to review agencies and Working Committees. There are 3 Working Committees who coordinate information flow and feedback between proponent and appropriate agencies: Environment/Resource/Land Use, Social/Economic, and Energy/Economics/Finance.
- Discussion between proponent/consultant and working committees will focus on the development of siting preference, benefit/cost analysis, environmental impact assessment, compensation/mitigation proposals and other information needed for preparation of an Application.
- An Application for an Energy Project Certificate, accompanied by benefit/cost analysis, an EIA, compensation/mitigation and monitoring proposals and containing other information required by the Regulation, may be reviewed by the EPCC to identify deficiencies before it is formally submitted to the Minister of Energy, Mines and Petroleum Resources.
- The Minister of Energy, Mines and Petroleum Resources will then advise the proponent regarding the deficiencies and request that they be remedied prior to a decision being made on disposition of the project.
- The EPCC advises Minister of Energy, Mines and Petroleum Resources and Minister of Environment of recommended disposition: either a public hearing through Utilities Commission and decision by Cabinet or exemption from provisions of the Act.
- If an Application is referred to the Commission for a public hearing, the EPCC coordinates the drafting of terms of reference which are presented to the Ministers for their review and decision. Following the hearing, the Commission reports to the Ministers. The Minister of Energy, Mines and Petroleum Resources, with the concurrence of the Minister of Environment, will announce the disposition of the Application.
- If a public utility applies for an Energy Project Certificate the Ministers may, in special cases, refer the Application to the Commission for regulatory review and a decision. This may include the holding of a public hearing.
- If the Ministers choose to exempt an Application from the provisions of the Act, the EPCC will coordinate the drafting of necessary terms and conditions to be contained in the Exemption Order in consultation with agencies.
- Individual agencies may be assigned responsibilities to ensure that an applicant complies with terms and conditions specified in an Energy Project Certificate, Energy Operation Certificate, and/or Exemption Order.

From Environmental Assessment In Canada, 1982 Summary of Current Practice, January, 1982, at pp. 13 & 16.

Section 9 of the Environmental Management Act establishes an enforcement service of conservation officers. The Minister of Environment may also designate an analyst who would standardize analytical procedures to make the permit process more consistent. Id., sec. 10. A maximum penalty of \$100,000 can be assessed under the Act. The degree of scienter, however, can affect the penalty levied. The Crown is free to pursue a liability action for environmental damage. Id., sec. 14.

An Environmental Appeal Board has been organized under the Act. The Board chairman and members are appointed by the Lt. Governor in Council. The Board consolidates appeals which stem from associated legislation such as the Waste Management Act and the Pesticide Control Act. Id., sec. 11. An appellant must give timely and proper notice to the Board of his intention to appeal. Procedural Regulations of the Environmental Appeal Board, sec. 3, (1982). If the appeal is heard, the Board, or a panel of Board members, will issue the decision with written reasons for the decision. A copy is sent to the Minister of Environment and the appealing parties. Id., sec. 6. Transcripts are available at cost to a person requesting them from the Chairman of the Board or panel. Id., sec. 10. The process is set out on the facing page diagram.

EMA is both time-consuming and procedurally burdensome, and as a result it is rarely used by those charged with environmental enforcement who prefer to use the aforementioned environmental review and assessment procedures available in the various other B.C. statutes and only threaten to force an EMA review. Wolferstan and Sector, Victoria, August 1984.

3. Waste Management Act

Any discharge of waste (including effluent refuse, special waste, and anything so designated by the Lt. Governor) requires a permit or an approval under the Waste Management Act. Bill No. 52, June 1982. In applying for a permit, sufficient information must be provided for a thorough evaluation, including quality, quantity, and the state of the receiving environment. The Act encourages waste management plans. Id., sec. 16. The Minister has power to approve the plans, and consults with municipalities and the Ministry of Municipal Affairs. The Lt. Governor has power to designate, change the boundaries of, or eliminate sewage control areas. Id., sec. 17.

Permits are issued by one of eight regional waste managers. Waste managers may require conditions for issuance, and may consult with the general public and other resource managers.

Regional districts which are treating wastes from industrial sources may restrict or control the types and strengths of wastes being discharged to their treatment plants. These restrictions are aimed at preventing the discharge of heavy metals or other toxics to facilities which are not designed to treat those wastes.

Conditions for dumping or storage permits may include requirements for (1) the permittee to give security in the amount and form specified by the manager, and (2) the permittee to monitor all aspects of handling, treating, discharging or storing the waste including the "places and things" that the manager considers will be affected by the discharge of waste. Id. sec. 8.

An approval allows introduction of waste into the environment without a permit. It can also include conditions but the duration of an approval may not exceed twelve months. Id., secs. 9, 11.4. A manager may order abatement, adjustments, investigations, or tests regarding pollution by either a person or a municipality. Id., secs. 16.7, 22. The Act controls and allows permits for storage of special (hazardous) wastes. Id., sec. 4. Wastes are designated hazardous on the basis of their components, quality, and production process. Synopsis of Waste Management Act, June 1982, p. 3. The Act also provides a "cradle-to-grave" tracking system which insures that wastes go from their origin to the proper disposal sites. Id., p. 4, no. 5.

Spills of wastes can be prevented by having the Minister of Environment require spill prevention works. Waste Management Act, sec. 10. The responsible person must immediately report the spill to the Ministry. It is presumed that the responsible person has knowledge of the spill. Id., sec. 10.6. The Waste Management Act, or regulations and permits under it, take precedence over any municipal bylaws. Id., sec. 20. Appeals from a decision of a Regional Waste Manager go first to the Director of Waste Management, then to the aforementioned Environmental Appeal Board. Id., sec. 27.

Acting under the authority of the Waste Management Act (and apparently under the Pollution Control Act, 1967?) a series of objectives have been published, pursuant to direction given by Orders in Council, by the B.C. Pollution Control Board, dealing, inter alia, with mining, smelting and related industries. Pollution Control Objectives for the Mining, Smelting and Related Industries of British Columbia, 1979. Province of British Columbia, Ministry of Environment. While general in nature, specific sections deal with air and water pollution by naming pollutants and specifying permitted amounts of discharge, and by setting general standards for "discharges to land": (1) the choice of site and disposal method must minimize potential fire nuisance and pollution; (2) the frequency of covering is to

be specified at each site; (3) open burning is prohibited; (4) the hazardous waste disposal method at each site will be designed by the Director. Id., at p. 12.

In addition, new special waste regulations under the Waste Management Act apply to hazardous wastes but appear to exempt most mineral tailings. Special Waste Regulation, B.C. Reg. 42/84, Order in Council 236, February 10, 1984. It would, however, apply to any acid leachate used in the process. Id., pp. 8-13.

This Act is likely to be used to review the environmental consequences of a nodules processing plant. Interview with Sector and Wolferstan, Victoria, August 1984.

4. Energy Project Certificates and the Utilities Commission Act

While there appears to be general agreement among Canadian experts that Canadian mining laws per se will not apply to a plant processing non-Canadian minerals (Sector and Wolferstan, Victoria, 1984; Crook and Basham, Victoria, August 1984) the Ministry of Energy, Mines and Petroleum Resources are nonetheless likely to get heavily into the permitting of a manganese nodule processing plant through the Energy Project Certificate Process under the Utilities Commission Act, sbc Ch. 60, 1980. Chris Sanderson, Vancouver, August 1984; Dennis O'Gorman, Victoria, August 1984. See for a complete discussion, Jon O'Riordon, "Energy Projects and the Planning Process: A Canadian Perspective" in Cope, Hills & James (eds.), Energy Policy and Land Use Planning (1984).

The Act is designed to regulate not only public utilities, but also users of large amounts of energy. It specifically applies to smelting, and the project review briefly described below is not limited to energy matters, but deals in considerable detail with environmental concerns as well. Interviews with Sanderson in Vancouver, and O'Gorman in Victoria, both August 1984.

FIGURE 2
APPROVAL AND IMPLEMENTATION OF CONDITIONS

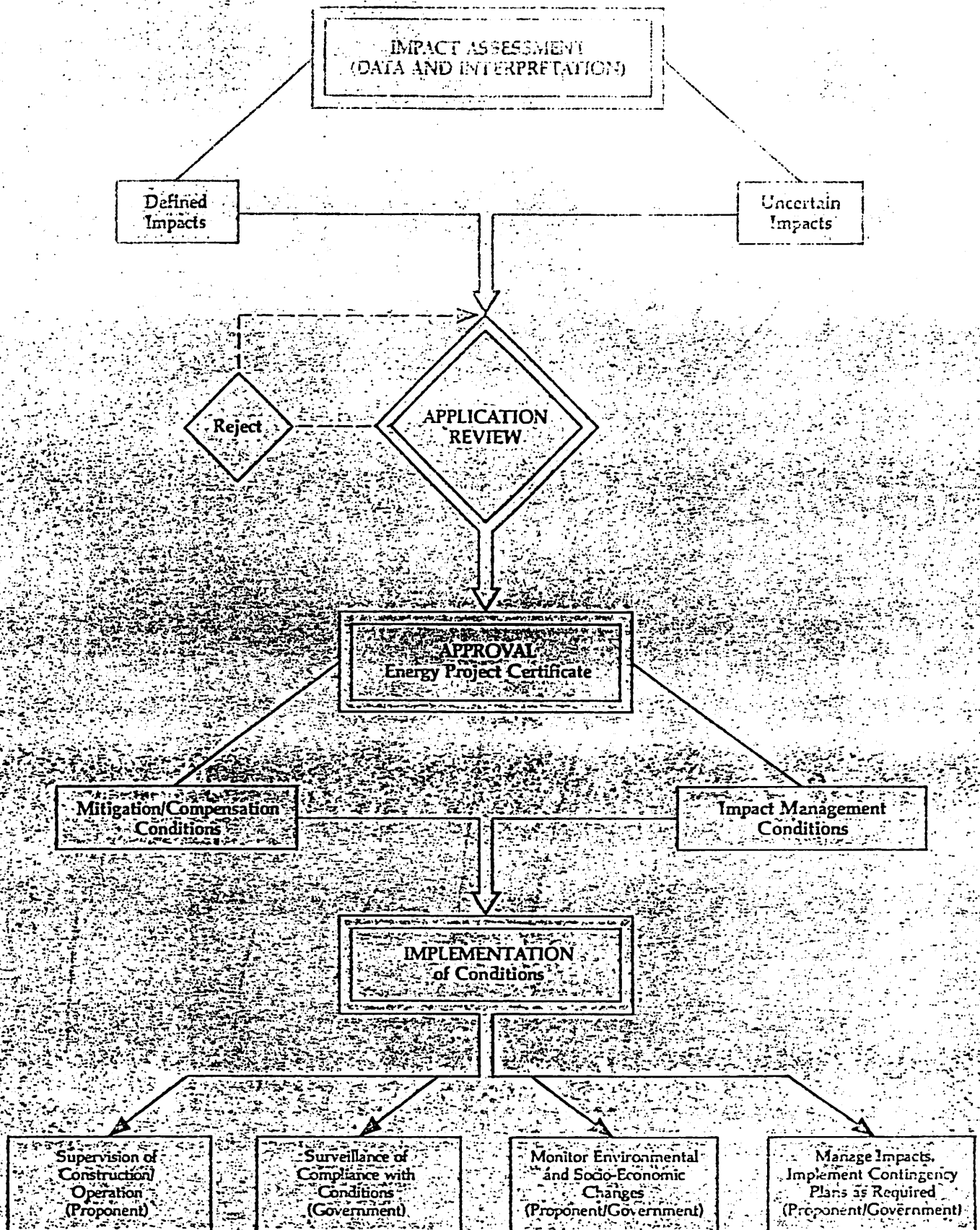


FIGURE 1

OUTLINE OF PLANNING AND IMPLEMENTATION PROCESS FOR MAJOR ENERGY PROJECTS IN BRITISH COLUMBIA

PHASE	FUNCTIONS
PRE-APPLICATION	<u>Initial Consultation and Brief</u> — Project description — Data collection — Review of preliminary and proposed studies — Review of terms of reference for project study
APPLICATION	<u>Presentation of Studies</u> — Project justification — Identification and assessment of impacts — Proposals for mitigation/compensation — Proposals for field inspection and monitoring — Identification of data deficiencies/uncertainties
PUBLIC HEARING*	<u>Evaluation of Studies</u> — Review of design plans — Elaboration of impact assessment — Refinement of mitigation/compensation and implementation proposals — Further evaluation and clarification of data and deficiencies
ENERGY PROJECT CERTIFICATE	<u>Approval-in-Principle and Conditions</u> — Approval of design and location — Certificate conditions: mitigation/compensation measures — Certificate conditions: contingency planning measures — Establishment-in-principle of surveillance and monitoring responsibilities
OTHER PERMITS	<u>Specific Approvals and Conditions</u> — Issuance of permits and approvals under other statutes — Detailed conditions by statute — Conditions from all sources incorporated into contract specifications
PRE-CONSTRUCTION	<u>Site Interpretation of Conditions</u> — Field review of specifications and regional liaison — Finalization of construction procedures and mitigation measures — Finalization of surveillance and monitoring programs by responsible agencies — Collection of additional baseline monitoring data if required
CONSTRUCTION	<u>Implementation of Conditions</u> — Field adjustment to design plans as required — Surveillance of compliance with conditions — Monitoring of environmental/socio-economic conditions — Contingency response to impacts
POST-CONSTRUCTION	<u>Implementation of Conditions/Compliance with Certificate</u> — Surveillance of compliance with conditions — Monitoring of environmental/socio-economic conditions — Additional remedial measures as required — Evaluation of substantial compliance with certificate
ENERGY OPERATION CERTIFICATE	<u>Operational Conditions</u> — Further conditions as necessary — Surveillance and monitoring as required

* This assumes disposition of an application under Section 19 (1) (a) of the Act and the issuance of an Energy Project/Operation Certificate. Disposition under Section 19 (1) (c) does not result in a public hearing or issuance of an Energy Operation Certificate. A ministerial order would replace the Energy Project Certificate.

It appears the purpose of the Act is to provide a "single-window" assessment process for large, energy-demanding projects. Sanderson and Gorman, *Id.* Assuming, as is likely, that the process of manganese nodules will trigger the need for an Energy Project Certificate under the Act, there appear to be two options available:

a. Apply to the Minister of Energy, Mines and Natural Resources for a Certificate, which he may grant, subject to virtually any conditions deemed to be in the public interest. Act, s. 19(1)(c). This requires the concurrence of the Minister of Environment. Technically, a Certificate does not issue, but an Order does, "exempting" the applicant but containing many conditions.

b. Refer the application to the B.C. Utilities Commission, for a complete review and hearing process (Act, s. 19(1)(a)), which is quite lengthy and which most private applicants strive to avoid. Sanderson, Vancouver, August 1984. The process is depicted on the facing page, with a brief outline of the procedures, all taken from "Implementation of Conditions of an Energy Project Certificate & Energy Operation Certificate, A Technical Discussion Paper," published by the Project Analysis Branch, Energy Resource Division, Ministry of Energy, Mines and Petroleum Resources, May 1983. It is worth noting that either the Certificate or the exemption described above appear to take precedence over other environmental laws and planning and zoning controls, thereby providing for a sort of master permitting process. O'Gorman, Victoria, August 1984.

5. Miscellaneous Applicable Environmental Laws

In order to use, divert, or store water, or to work near a watercourse, a license is required from the Water Management Branch, Ministry of Environment. (B.C. Water Act, #4 Doing Business in B.C.) No right to divert or use water may be acquired by prescription. Wildsmith, p. 173. While disposal of sewage is regulated under the Waste Management Act, installation or expansion of a small sewer system is regulated under the Health Act. All plans, engineer's reports, and estimates, specifications, information, and data should be submitted to the Minister of Health. RSBC 1960, c. 170, sec. 21.

Finally, the Municipal Act delegates authority to Municipal Councils to pass bylaws covering many environmental concerns. RSBC 1960, c. 255. Municipal regulation with bylaws is allowed for control of flow in any waterway, prevention of nuisances, controlling emissions, prohibition of noxious activity, direction for waste disposal, regulation of sewer works, establishment of waste disposal sites, and formation of waste collection systems.

V. Conclusion

According to government experts in Vancouver and Ottawa, there are three acceptable sites on the B.C. coast for a manganese nodule processing plant:

1. Kitimat, in the Douglas Channel, where there are already some plants and docking facilities. However, all approaches to suitable sites in that area are long (at least 100 miles) and it is subject to strong winds, making navigation difficult at times.
2. Port Simpson, 28 kilometers from Prince Rupert and the site of a Dome Petroleum LNG proposal. It reportedly has the best sea-based access on the coast, but there is presently no land-based transportation link. The site has a great deal of flat land, with 4 kilometers of suitable shoreland.
3. Prince Rupert's North Shore. The area is already designated on various plans as for industrial use, some development has already taken place (including some harbor works) and some 300 hectares is available for a plant.

The applicable laws have been superbly summarized in chart form by some of the top legal experts in B.C. through the fortuitous choosing of a processing plant hypothetical at a recent (October 1983) continuing legal education seminar on Environmental Law and Practice organized by the Continuing Legal Education Society of British Columbia in Vancouver. We here present their summary and hypothetical, reprinted by permission of the Society through its executive director, Jack Huberman. We note in passing that of the faculty, we interviewed five for this project, including the course coordinator, Rodney Snow (others: Paul Jarman, Clem Pelletier, Kim Roberts and Andrew Thompson).

Permits and Approvals - A Case Study

Monetary Resources Ltd. is a Vancouver based company which has discovered gold on Moresby Island, Queen Charlotte Islands. Geological and engineering feasibility studies indicate a favorable return on the property.

The proposed development is situated on crown land in a remote region of Moresby Island. The region is heavily forested and receives more than 2000 millimetres of rain per year. The area is characterized by many small water courses, the major one being the Salmon River. Due to recent increased fishing pressures from both commercial and native fishermen, the salmon stocks of the Salmon River and its tributaries have been seriously depleted.

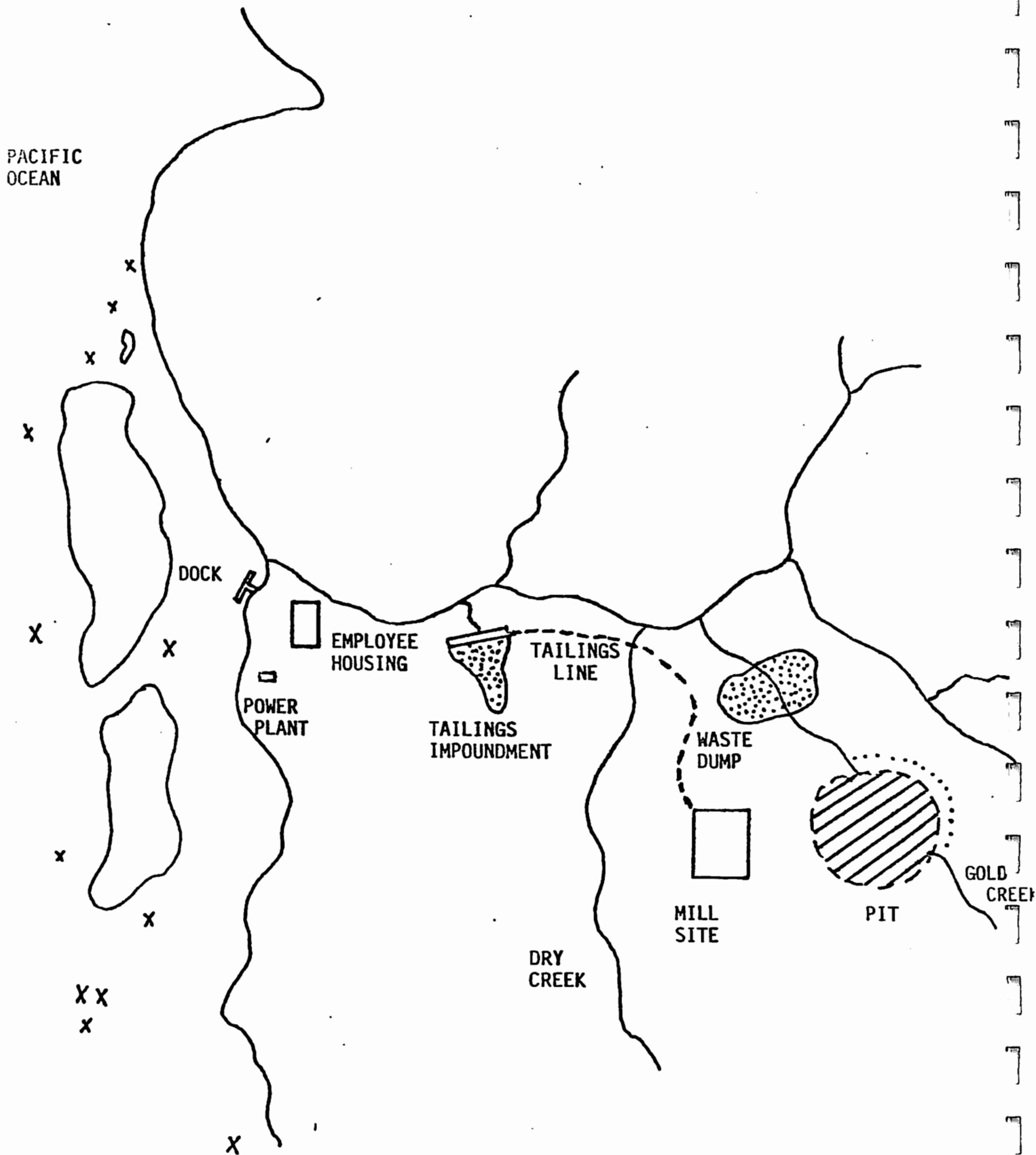
The proposed development will include an open-pit mine, a processing mill with ancillary facilities, and a tailings impoundment. A production rate of 1,000 tons of ore per day is anticipated. The ancillary facilities will consist of a road network, an oil-fired power generation plant, and employee housing (dormitory style) with its associated facilities (i.e. garbage dump, sewage treatment facilities, etc.). Supplies and materials will be transported to and from the minesite by barge. Dock facilities will be constructed in a sheltered bay close to the minesite. The proposed layout of the development is illustrated in the accompanying figure.

The proposed open-pit is located adjacent to Gold Creek, a small fish bearing tributary of the Salmon River. Due to the location of the gold reserves, it may be desirable to divert Gold Creek around the pit area. The initial geological reports indicate considerable sulphide mineralization in the area and so the acid generation capabilities of the ore and waste rock are anticipated to be significant. In addition, pit dewatering volumes are expected to be large due to the high rainfall in the area. Pit water may require treatment before discharge to the environment.

For process mill operation, it will be necessary to divert water from Dry Creek. This water will be used in the gold milling process and will be discharged to the tailings impoundment. Being an area where precipitation exceeds evaporation, a closed circuit with zero discharge will be unattainable. Since cyanide is a major component in the gold leaching process, the liquid effluent will require treatment before discharge to the impoundment. Discharge from the tailings pond to the fish-bearing stream will have to meet very stringent controls.

Given the topography of the area, the most suitable location for constructing the tailings impoundment is in a minor tributary of the Salmon River. This narrow steep-sided valley drains directly into the Salmon River. The waste rock dump would be situated downstream from the pit and straddle Gold Creek. The waste rock from a high sulphide ore body may create an acid leaching problem with resultant impact on the fisheries.

MONETARY RESOURCES LTD.
LAYOUT OF THE PROPOSED DEVELOPMENT



MONETARY RESOURCES LTD. - MORESBY ISLAND PROJECT

**Stage Three Permit, Approval, and
Licensing Applications**

<u>Project Component</u>	<u>Permit Approval or Licence</u>	<u>Statute</u>	<u>Agency</u>	<u>Time</u>	<u>Opportunitites for Public Participation</u>
Roads	1. Special Use Permit for Right of Way	Forest Act	Ministry of Forests, Regional Manager	4-10 months	No
	2. Special Use Permit for Gravel Pits	Forest Act	"	4-10 months	No
	3. Stream Crossing	Fisheries Act (Canada) S. 31	Dept. of Fisheries and Oceans	2-4 months	No
	4. Approval to cross or join public road or Highway	Highway (Industrial) Act	Highways Branch Ministry of Transportation and Highways		
Construction Camp	1. Waste Management Sewage, Effluent Approval	Waste Management Act, S. 9	Regional Manager, Waste Management Act	1 month (valid 6 months with one renewal)	No h
	2. Permit for Sewage and Water	Health Act and Sewage Disposal Regulations pursuant thereto	Medical Health Officer	1 week	No

<u>Project Component</u>	<u>Permit Approval or Licence</u>	<u>Statute</u>	<u>Agency</u>	<u>Time</u>	<u>Opportunities for Public Participation</u>
	3. Medical Health Officer-approval of food premises	Health Act	Medical Health Officer	1 week	No
	4. Waste Management Branch refuse permit for domestic garbage disposal	Land Act	Ministry of Lands, Parks and Housing	1 month (valid for 6 months with one renewal)	No
Dock Facilities	1. Foreshore lease or licence	Land Act	Ministry of Lands, Parks and Housing	12-18 months	No
	2. Navigable Water Protection Act Permit	Navigable Waters Protection Act (Canada)	Canadian Coast Guard	4-6 months	No
	3. Federal Fisheries approval	Fisheries Act S. 31 (on referral from Coast Guard)	Department of Fisheries and Oceans	4-6 months	No
Fuel Storage Facility	1. Electrical Inspectors' Approval	Electrical Inspection Act	Ministry of Labour: Electrical Inspection Branch	?	No
	2. Oil Spill Contingency Plan (if ordered)	Waste Management Act S. 10	Waste Management Branch: Ministry of Environment	?	No
Open Pit	1. Mine Plan	Mines Act	Inspection and Engineering Division: Ministry of Energy, Mines and Petroleum Resources	2-3 months	No
	2. Reclamation Permit	Mines Act	"	4-6 months	No

<u>Project Component</u>	<u>Permit Approval or Licence</u>	<u>Statute</u>	<u>Agency</u>	<u>Time</u>	<u>Opportunities for Public Participation</u>
	3. Waste Rock Disposal approval	Mines Act	Inspection and Engineering Division: Ministry of Mines and Petroleum Resources	4-6 months	No
Diversion of Cold Creek	1. Approval to make changes in or about stream	Water Act S. 7	Water Management Branch: Ministry of the Environment	2-6 weeks if Stage I satisfactory	No
	2. Fisheries Act Approval to alter fish habitat	Fisheries Act (Canada) S. 31	Department of Fisheries and Oceans	2-4 months	No
Pitwater and Waste Rock Runoff	(Diverted to tailings pond in this fact pattern but if this water is not diverted see "Mill Tailings and Surface Water Disposal from Mill, Pit, or Waste Rock" below)				
Mill Water Supply	1. Water Licence	Water Act S. 4 and S. 8	Water Management Branch: Ministry of Environment (Comptroller of Water Rights)	2 years	Yes, by Riparian owner, other licensee or other applicant (the above is discretionary with appeal)

<u>Project Component</u>	<u>Permit Approval or Licence</u>	<u>Statute</u>	<u>Agency</u>	<u>Time</u>	<u>Opportunities for Public Participation</u>
	2. Fisheries Act Approval (if would lead to distruction of fish habitat)	Fisheries Act (Canada) S. 31	Department of Fisheries and Oceans	2-4 months	No
Mill Tailings and Surface Water Disposal from Mill, Pit, or Waste Rock	1. Waste Management Effluent Permit (applicable standards: see pollution control objectives for the mining, smelting and related industries of B.C. (1979))	Water Management Act S. 3	Regional Manager Waste Management Act	6-12 months	Yes, pursuant to Sections 5 and 6 of Waste Management Regulations
	2. Federal Metal Mining Liquid Effluent regulation standards are applicable in some cases	Regulations under Fisheries Act (Canada)	Environmental Protection Service (Canada)	N/A	No
Refuse, Garbage, Industrial Refuse	1. Waste Management Refuse Permit	Waste Management Act S. 3	Regional Manager Waste Management Act	6-12 months	Yes, pursuant to Sections 5 and 6 of Waste Management Regulations
Mill Air Emissions	1. Waste Management Air Emissions Permit	Waste Management Act S. 3	Regional Manager Waste Management Act	6-12 months	Yes, pursuant to Sections 5 and 6 of Waste Management Regulations

<u>Project Component</u>	<u>Permit Approval or Licence</u>	<u>Statute</u>	<u>Agency</u>	<u>Time</u>	<u>Opportunities for Public Participation</u>
miscellaneous	1. Permit to excavate or alter a provincial heritage site and to remove, move or alter heritage objects from it, must be obtained	Heritage Conservation Branch, Ministry of Provincial Secretary and Government Services	No		No
	2. Requirement for Impact Assessment, Environmental Protection Order, as required	Environment Management Act	Assessment Branch, Ministry of Environment		Yes, if Minister orders inquiry
	3. Regulated project approval required if e.g. (i) more than 3 PJ of energy consumed/year (ii) power plant 20 MW capacity	Utilities Commission Act	Energy Resources Division, Ministry of Energy, Mines and Petroleum Resources		Yes, if hearing ordered

C O L O M B I A

C O L O M B I A

I. Substantive Introduction

A. Scope of Case Study and Conclusion

The situation in Colombia is not vastly different from Ecuador, but there are differences, especially those which influence, but are not a part of, the legal situation. The first of these is the relatively insecure nature of many parts of the country outside the capital city of Bogota. The widely reported war against cocaine traffickers as a result of the assassination of his Justice Minister (Lara) may threaten the accord which President Betancur has allegedly reached with the 20,000-30,000 guerrillas who until recently kidnapped the wealthy at random for ransom to support their insurgent activities, according to several sources in Colombia. This measure of insecurity cannot help but affect the business climate for locating such a facility as we visualize in our study.

A second major factor is the relatively (compared to Ecuador) undeveloped nature of Colombia's Pacific coast. While there are plans for port development (as described below) there is presently no port facility, and virtually no infrastructure - especially adequate electricity - that would presently support such a processing plant on the Pacific coast. On the other hand, there is little competing use with which to deal - tourism, residence, unrelated commercial activity - which could prove troublesome in other countries.

Lastly, as also appears below, the major government "umbrella" agency for natural resources and environment protection is reluctant to participate apparently out of concern for leaning toward an as yet unconsidered decision about such a plant.

It is difficult if not impossible for a foreign corporation to undertake a project anything near the scale of a manganese nodule processing plant without setting up a Colombian corporation which will be substantially made up of Colombian interests. It is especially so when locating such a project in the coastal areas, which the armed forces regard as strategic. Passing these matters, from a land/environment regulation perspective basically five agencies are responsible for permits/approvals:

1. The Department of National Planning, which must approve any foreign investment in Colombia. It works in an essentially ad hoc fashion under a largely economic plan on a case-by-case basis. The official in charge of the appropriate

section has serious reservations about the sufficiency of electricity and other infrastructure requirements on the Pacific coast, noting that only Buenaventura and Tumaco (near the Ecuadorian border) are even remote possibilities.

2. DIMAR, a Department of Defense agency, responsible for approving all new port facilities, appears most receptive to the idea of a processing plant on the Pacific coast. The navy has begun to create a port facility at Bahia Malaga, and might well welcome such a processing plant there.

3. COLPUERTOS is responsible for new facilities in existing ports under a variety of laws discussed below.

4. The Department of Health is responsible for implementing the relatively new water and air pollution legislation, the latter of which is currently being revised. The water pollution law would probably cover the dumping of any tailings in the ocean area of a port.

5. Lastly, INDERENA has the authority under a 1974 decree to enforce the Colombia EIS Law (Decree No. 2811). It appears that nearly every subject-specific decree or legislative act has such a provision, but it is mainly up to INDERENA to enforce them and if an EIS or EIA shows sufficient adverse impact, the proper ministry can require mitigation measures, such as a plan which will show what will be done to correct the adverse effects over the next 24 months. If no such plan is forthcoming, then any temporary permits may be revoked and/or no permanent one will be issued by that ministry. INDERENA is concerned about where the nodules are coming from and, as signatories of the law of the sea convention, indicated the possibility of rejecting such a plant on the ground that the nodules, if they come from the "deep sea" as expected, are the common heritage of mankind.

Finally, an interesting sidelight is the apparent attitude of the mines and minerals people that their mining laws would not apply to the processing of minerals that do not come from Colombia.

B. Summary of Background Factors

1. Geography and Climate

Located in the Northwest corner of South America, Colombia is that continent's fourth largest country. It has over 700 miles of Pacific coastline, which is by and large hot and humid throughout most of the year. Bus. Travel. Handbook, at p. 95.

2. Population and Language

The labor force in Colombia is approximately 6,226,000, the majority of which speaks Spanish. Handbook, supra, at 47. Less than one percent of that force is in the mining and extractive industries. Id.

3. Government

Colombia is a unitary republic with a centralized government set up by its Constitution of 1886 and significant amendments passed by legislative acts in 1910, 1936, 1945, 1946, 1959, 1968, national plebiscite in 1957, and legislative decrees in 1957 (Handbook, p. 259). While there are three branches of government (as in the U.S.), the executive branch is the strongest by far, consisting of the President (elected by popular vote every four years but who cannot serve consecutive terms), a thirteen member cabinet appointed by the President, many administrative departments and decentralized agencies, and a limited (but developing) civil service bureaucracy. (Handbook p. 262.) The Legislative branch consists of a House of Representatives and a Senate, elected by popular vote. Handbook, p. 265.

Finally, there are twenty-two administrative units called Departments and eight territories including four intendencias and four commissaryships. Each unit has a governor appointed by the President. The Departments have elected assemblies with very limited powers while the territories are controlled directly from the national government. The local government acts basically as an implementer rather than a policymaker (Handbook, p. 257).

The President has the most power in the Colombian government. Among his powers is the power to appoint and dismiss all the governors of the departments and territories. (Handbook, p. 262.) He also has broad legislative powers. He has the authority to direct economic policy, draw up a budget, submit development plans to Congress, determine the money supply, regulate exchange rates, fix tariffs, finance the public debt, allocate credit, and redistribute funds.

The thirteen ministries are agriculture, communications, economic development, finance and public credit, foreign relations, government, justice, labor and social security, mines and energy, national defense, national education, public health, and public works. (Handbook, p. 264.) There is also a Council of State, whose ten members are elected by "cooptacion": they are self-elected whenever a vacancy occurs due to death, illness, retirement or resignation. The Council serves as an advisory board to the President, with authority to draft bills and

codes and submit legislative reforms in the area of administration. In the review and revision of administrative codes, decrees, and legislation, the Council has power equal to the Supreme Court. Letter from attorney Jorge P. Cardenas, March 5, 1985. (Handbook, p. 265).

Congress has the power to amend the Constitution, initiate, amend, interpret, and repeal legislation; inaugurate the President; select the designate; elect the Supreme Court; change the boundaries of the territories; create new departments; grant special powers to the departmental legislatures; move the location of the national capital in extraordinary circumstances; supervise the public service and create new positions; fix national revenues; provide for payment of the national debt; and determine the national currency (letter from attorney Jorge P. Cardenas, March 5, 1985, and Handbook, p. 267).

Most legislative policy is initiated by the executive, the bureaucracy, or the parties. (Handbook, p. 267.)

The civil service became a true professional bureaucratic body under Law No. 19 (1969). Its main function is to create and implement long term national planning and programs (Handbook, p. 271). There are more than 107 semiautonomous or decentralized government agencies with regulatory functions (Handbook, p. 272).

4. Ports

There are a number of ports on the Pacific coast, but only two appear to be commercial. There are plans to bring infrastructure development to some of them, but little has been done so far with the exception of the Pacific port of Buenaventura, which has both rail and road links with the developed interior. Dept. of National Planning, Foreign Investment In Colombia, 1980 map. Interview with Admiral Angel, DIMAR, Bogota, May 1984. Pacific port development is often a military matter outside existing commercial ports, which are under the control of a national corporation, discussed in more detail below. Id. and interview with Captain Sanchez of Colpuertos, Bogota, May 1984.

5. Energy and Communications

Most of the Colombian road and railway network beyond the central plateau upon which Bogota sits extends toward the Atlantic rather than the Pacific coast, except for the port of Buenaventura, as noted above. There is virtually no energy development in the Pacific coastal area of a scale that would

support manganese nodule processing. Interview/Sra. Molina, Department of Planning, Bogota, May 1984.

6. Investment Atmosphere

This subject is treated extensively by the part of this report dealing with economic and business climate. In summary, in 1982, \$139 million was approved for investment, down from \$166 million in 1981. The inflation rate for 1984 is down to 17 percent. Increases in wages were granted a minimum 25 percent with an average increase predicted to be near 30 percent, compared to 30-32 percent in 1982. Nominal interest rates 34 percent p.a. and predicted to be at 32 percent by the end of 1983. But effective rates were expected to be near 40 percent due to fees, insurance charges, and other fees. Money supply growth was predicted to be at least 22 percent in 1983. Export financing was 18 percent, down from 19 percent (Business Latin America, 4/13/83).

II. Property Laws

The Colombian legal system is based on the Spanish Code of 1822 reflecting a large Roman influence (Handbook, p. 410).

All lands within the boundaries of Colombia are the property of the State if there are no other owners. Property owned by the Republic of Colombia is termed bienes de la uni'on. If used by the general public, it is termed public property or property in public use (Vargas, 246). Foreigners can own property in Colombia subject to the Civil Code (Vargas, 245).

Expropriation may be carried out by judicial order and previous compensation, for reasons of public benefit (utilidad pu'blica) or social interest. In certain cases for reasons of equity, the law may specify cases in which there shall be no compensation. This requires a favorable vote of an absolute majority of both houses of Congress. The procedure to be followed is governed by Articles 852 to 861 of the Judicial Code (Vargas, direct quote, 248).

Law 14 of 1945 declared as of public benefit and social interest the acquisition of areas of land which public agencies may need for public service enterprises, such as telephones, electric power plants, slaughter houses, market places and buildings, and the improvement of hospitals, jails, etc. (Vargas, 249).

III. Applicable Land Use and Planning Laws

Because of the probable location of a project like a manganese nodules processing plant in the relatively undeveloped Pacific coastal zone, there is no applicable local planning and zoning law. Interview with Diana Molina and Jaime Toro, Department of National Planning, Bogota, May 1984. The only applicable plan would be a rough national set of goals and priorities addressing such diverse subjects as availability of infrastructure and admission of foreign investments. The National Plan as such appears to have virtually no applicable land use component. Id. According to officials in the water and natural resources section of the Department of National Planning it would appear that only two areas are likely immediate prospective sites for a processing plant: Buenaventura and Tumaco. While both are served by roads and the former has rail links to the interior of Colombia as well, officials stressed there is so far no where near enough electricity for such a plant as our theoretical model at either port, and there may well be fresh water shortages as well. There is also a possibility for use of the military harbor at Puerto Malaga, but this would require military permission, probably through DIMAR, as discussed below. Id.

The main thrust of national planning is economic, and these aspects of Colombia are addressed in that portion of this report dealing with business and economic climate. Suffice it here to say that under Andean Pact legislation and rules promulgated by Colombia (Treaty creating the Cartagena Agreement, Court of Justice, May 28, 1979, approved by the Colombian Congress by Law 17 of 1980) the Colombian Department of National Planning is the agency to which application must be made for foreign investment of the type contemplated for a manganese nodule processing plant. Decree 170, January 27, 1977, Art. 1, and Decree 1161, May 23, 1979, Arts. 3, 4 and 5. See Foreign Investment in Colombia supra, pp. 17-20. Interviews with attorneys Camilo Caicedo, Jorge Cardenas, and Diana Molina and Jaime Toro in the National Planning Department, May, 1984. There is some indication that the Department of National Planning would require the setting up first of a Colombian company, before reviewing an application for such foreign investments. Interview with Diana Molina and Jaime Toro in Bogota, May 1984, although a prominent attorney indicated the procedure is the other way around. Letter of attorney Jorge P. Cardenas, March 5, 1985. The Commission set up by the aforementioned Cartagena Agreement has set out a fairly detailed list of requirement for such an application, including such things as lists of tangible resources, right down to spare parts for necessary machinery. Decision 24, Dec. 31/70, at pp. 32-34 of Foreign Investment in Colombia, as amended by Decisions No. 46, 103, 109, 110, 124, and 186 of the Andean Pact. Letter of attorney Jorge P. Cardenas, March 5, 1985.

IV. Environmental Laws

Colombia has both substantive (air, water) pollution and environmental impact laws which are far more important than national planning laws from the perspective of applicable resource laws. The former is the province of a Commission in the Department of Health, known by the acronym CORELS. The latter is the responsibility of the powerful natural resources permitting agency, Institute for Development of Renewable Natural Resources (INDERENA), which was organized in 1968 to integrate management of water, soil, plant and animal resources, and to protect the community from their mismanagement and provide for their future. Decree No. 2811 of 1974. Interview/Leon Canon, Director, CORELS, attorney Camilo Caicedo, Captain Jaime Sanchez, Colpuertos, and attorney Jorge Cardenas, all in Bogota, May 1984.

A. Substantive Environmental Laws

Colombia's protective measures for air and water are basically set out in two comprehensive presidential decrees which vest basic rule promulgation and enforcement, together with detailed standards for air emissions, in the Department of Health. Decree No. 2, 11 January, 1982 (air) (previous decrees issued in 1974 and 1979) and Decree No. 19, 2 August 1983, supplementing Congressional Law 9 of 1979 (water). Among the host of directives contained in the latter is Article 231 prohibiting the discharge of industrial wastes in liquid form into public sewers before first constructing a system for final disposition. Necessary permits and sanctions are set out in the aforementioned 1983 decree. Finally, a decree is being presently drafted which will govern discharges particularly in ports. Interview with Dr. Canon, *supra*, in Bogota, May 1984. It is fairly clear that Colombia's experience with substantive environmental laws is so far new and enforcement is, for now, spotty.

B. Environmental Impact Assessment

Of considerably more significance is the authority of INDERENA to require an environmental impact analysis under the National Code for Natural Renewable Resources and the Protection of the Environment, under various decrees, and in particular Decree 2811 of 1974.

Article 1 of this Decree declares the environment to be the common heritage of mankind and directs private parties to participate with the government in its preservation and management. Based on the common heritage premise, Article 2 then declares the purpose of the code to protect the environment and natural resources. Article 3 sets out the various areas to be protected: water, soil, flora and fauna, energy resources, topography, geothermal resources, biological resources, and the

landscape. To be particularly protected against: waste, garbage and other residues, noise, urban or rural human activity which is environmentally degrading, and human production/cultivation which may damage the environment. While much of the Code then goes on to describe various study and education programs, the guts of an environmental assessment and review program are set out in Title IV describing a "System of Environmental Information" developers and commercial users, inter alia, are required to collect and provide to INDERENA information on hydrology, climate, geology, agriculture, inventories on flora and fauna, sources of emission and contamination, and so forth, which INDERENA would make available on a regular basis. Articles 21 and 23. Title VI of the Code, "Environmental Effects," then requires all parties undertaking a project or activity "susceptible" of producing environmental degradation to inform INDERENA of the possible dangers (Art. 27) which result from the activity or development, and to study the ecology and previous environment and obtain an appropriate license. Economic and social as well as environmental factors are to go into this report/study/assessment (Art. 28).

(Other sections of the Code deal with basic considerations to be addressed with respect to particular resources and sources of degradation.)

INDERENA has commenced writing regulations to implement this and other sections of the aforementioned Code. Interview with Director Margarita Marino and staff and attorney Eduardo Calle V., INDERENA, May 1984, Bogota. Meanwhile, apparently if the required study or impact statement (either one) discloses adverse environmental or natural resource effects pertaining to a particular project, the Minister under whose authority such a project would normally fall is authorized to require mitigation measures usually set out in a plan of the person or organization developing the project, during which time the person or organization gets a temporary license to proceed. If the Minister deems the plan sufficient, then no permanent permission or license for the project is forthcoming. The statements therefore appear to be for information only, upon which appropriate ministers can act to block a project. Interview with Dr. Canon of CORELS, Bogota, May 1984.

INDERENA officials stress that different standards apply to different projects depending upon what the required studies and statements disclose. Besides the aforementioned Code, there is as yet nothing in writing in terms of standards that INDERENA has which would apply to a manganese nodule processing plant. INDERENA is unwilling to hypothesize about the approval process without first seeing an informal application, for fear of skewing its analysis and approval process in favor of approval. There is apparently concern that the processing plant may not be welcome on the ground that the nodules would come from waters under dispute

in terms of the ownership of seabed resources under the Law of the Sea Convention which Colombia has apparently signed but not ratified. In particular, INDERENA is reluctant to respond to general oral questions and prefers to answer specific written questions about a specific project which, given the research and academic nature of our study, has been so far difficult to provide. To the general question of specifically what decrees and laws INDERENA would apply and what standards and criteria it would use among the many decrees and orders set out in the aforementioned Code, INDERENA has so far failed to respond and awaits instead specific questions on a specific project which we are so far unable to provide as we have no specific project in mind. Interview and exchange of correspondence with Director Margarita Marino of INDERENA and staff, Bogota, May 1984.

V. Ports

Colombia's coastal port development falls under the jurisdiction of two principal agencies, one military - DIMAR - and one civilian - COLPUERTOS - though the National Department of Planning has some say in wholly private port development as well.

A. DIMAR (Division for Marine and Harbor Affairs)

According to DIMAR's organic legislation, it has general jurisdiction over most marine matters, especially that regarding foreign shipping, and broad authority for studies, cooperation and management of marine affairs. Decree No. 2349, December 3, 1971, as amended by Decree No. 2324 of 1984. It is divided into several divisions, among them a juridical division with fairly broad implementation authority. Commencing at Article 87, the Decree sets out detailed provisions concerning how private parties must obtain permission in the form of a "concession" in order to build anything in the beach zone (at least 2 kilometers wide) as it is by law inalienably public property. This zone is known as the "National Coastline." Among other requirements for application for such a concession, local municipalities must be shown not to object, the plans for construction must be done "by competent individuals or firms," and INDERENA must certify that renewable natural resources will be conserved and protected and that it will issue the necessary licenses and permits under its jurisdiction (Art. 91(2)(c)). There follows hearings and studies, and eventually a permit (Art. 97) with a host of conditions, among the more salient of which are: at the end of the permit term, the development reverts to the state; that construction will follow health and safety norms in accordance with plans filed. The concession becomes a public document and registered as such. Supervision of the whole concession procedure appears to be the province of the Directorate General of Marines and Harbors of the Ministry of National Defense. Arts. 99 and 101. Also Decree No.

3137, Nov. 20, 1980, Art. 6 and 14. This Directorate is specifically empowered to execute government policy in the regulation and control of all marine and harbor activities (Art. 3(2)) and in particular, construction (Art. 3(17)). Violations of concession conditions and submissions can result in both loss of concession and fines.

The Colombian military - through DIMAR - thus has jurisdiction of new port construction activity - indeed any activity - within 50 miles of the Colombian coast. Therefore a "concession" from DIMAR would be necessary for any docking facilities in connection with a manganese nodule processing plant. DIMAR would require a plan of sorts which would deal with such questions as tides and winds, and would also require previous approval by the Department of Planning. (Decree No. 3137, Nov. 20, 1980, Art. 4.) Officials at DIMAR were receptive to the notion of such a plant at Malaga, where the navy is developing a port facility, though they stressed that except for Buenaventura, there was virtually no available electricity on the Pacific coast. Interview/Admiral Angel, CAN, May 1984. Decree No. 2349, December 3, 1971.

Finally, DIMAR has responsibility for prevention of the contamination of sea water under article 3 of its Decree 2349.

B. COLPUERTOS

Actual supervision of port activities, and in particular government activities including port construction activities, appear to be the responsibility of COLPUERTOS (La Empresa puertos de Colombia). Decree No. 2465, September 10, 1981. The primary responsibility of COLPUERTOS appears to be the oversight of day-to-day operations through port managers, though the construction of new port facilities is specifically listed as one of its duties. Art. 5(3). Actually, it does little more than decide if land is available in existing port areas for development or other uses. Interview/Captain Jaime Sanchez, Director, COLPUERTOS, Eduardo Ferrer, director of planning, and Betty Diaz Serrano, legal officer.

VI. Miscellaneous Land/Environmental Laws

A. Mining

The national mining laws of Colombia appear to apply mostly to what their name implies: the mining of Colombian minerals and the processing thereof, if any, rather than processing only, of foreign minerals. However, there is a provision in Decree 1275 of 1970 which deals with processing of minerals prior to export which could conceivably be interpreted to apply, though some think this is unlikely as this was not its

purpose. Interview/Eduardo Calle v. of INDERENA and Ana Isabel Diez de Leyva, Chief, Alternate Energy, Ministry of Mines and Energy, Bogota, May 1984.

B. Water Law

Rivers and all other waters that flow through natural channels and which do not rise and end within the property of a single owner are considered as property for public use and owned by the State. See Civil Code, Law 113 of 1928, and Decrees 1381 and 1382 of 1940, others.

The government, in its capacity as supreme administrator of property in a public use may regulate, whenever it deems this appropriate, the utilization of any national stream or water supply. The government may grant licenses, concessions, or permits for the use of public waters for definite purposes, for periods of not more than twenty years, under such regulations as it may determine. The government may refuse a grant of water rights for reasons of public utility or social interest (Vargas, 189).

Anyone wishing to obtain a water grant must submit an application to the ministry concerned, stating: name of the source from which water is to be taken; amount of water desired expressed in liters per second; purposes for which the water is to be used; name of the property or properties to be benefited; period for which the grant is requested; information as to whether permission has been obtained to erect a conduit through another's property, or whether an easement of aqueduct has been established. The application must be accompanied by a copy of the title to the property (Vargas, 191). The ministry must report on the effects of the proposed grant, and is authorized to require additional information. Provision must be made for control devices which will at all times show the amount of water being diverted. Any complete or partial transfer of the permit to a natural or juridical person, national or foreign, requires prior authorization from the government, which may refuse on grounds of public utility or the common good.

VII. Conclusion

On the whole, the range of land use and environmental permits necessary to site a manganese nodule processing plant on Colombia's Pacific coast is limited. The relatively unsettled nature of the Pacific coast makes it unlikely that much local government law would be applied, and it would appear that even those laws would give way to superseding national laws.

The most likely locations for such a plant appear to be at or near the port cities of Buenaventura and Tumaco, unless the military would include such a processing plant in its plans for the harbor at Malaga. In any event, given the importance the military attaches to such ports, a foreign consortium would almost certainly need a concession from DIMAR. It is conceivable permission from COLPUERTOS would also be necessary, and in any event the latter would certainly supervise construction.

However, the place to start would clearly be the National Planning Department which might or might not refer the application immediately to INDERENA. While the interests of the former would be almost entirely economic, INDERENA would clearly require an environmental impact analysis of the sort described in more detail in Part IV supra. Permits will also be necessary at least under Colombia's new water pollution code and, depending upon the process used, under air pollution regulations as well. The reporting and monitoring will probably fall to INDERENA, as well as the reporting and monitoring during construction and operation on all potentially detrimental environmental effects.

It does not appear that any of Colombia's mining laws will apply to this project.

E C U A D O R

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I. Introduction

A. Scope/Conclusion

The Ecuadorian constitution forbids foreign ownership within 25 miles of the coast or any national border, but the President may grant exceptions to this restriction, which he does by means of an executive decree after appropriate military reviews. Thereafter, it is necessary to comply with various laws and regulations relating to mining (there is a sharp difference of opinion among lawyers and officials concerning the applicability of such laws to processing only) protection of the environment, use of water, marine pollution, and a host of foreign investment permissions and requirements - including the need to enter into a contract with an appropriate central government ministry. The mining law is being substantially revised to make it easier for foreign companies to invest for such purposes in Ecuador.

With the possible exception of the military, there is a generally favorable reaction to the potential for locating a processing plant. The new president, Leon Febres Cordero, is a generally pro-development and pro-foreign investment engineer. The biggest problems seem to be the lack of financial incentives and lack of mineral information/surveys in Ecuador, coupled with a Byzantine and uncertain administrative process (which tends to change, such changes occasionally being retroactive). However, Ecuador recently became the first member of the Andean Pact to sign an agreement with the Overseas Private Investment Corp. (OPIC) to reinitiate OPIC private investment programs. Moreover, there is little experience with large mineral projects except those relating to oil, and the granting of concessions by previous governments (the central government owns all mineral resources) for its extraction left a bad taste in many Ecuadorian mouths. Today the only foreign mineral extraction activity appears to be gold, some copper, and zinc mining, though prospects for more are said to be good. "Ecuador: Not Only Oil, but Also Mining," Ministry of Natural Resources and Energy, April, 1984.

B. Background Factors

1. Geography/Climate

Continental Ecuador is crossed from north to south by two chains of the Andes mountains, which divide it into three different geographical regions. The Costa, or lowland region on the Pacific coast, is most likely for a manganese nodule processing plant. It consists of flat plains that gradually rise to the Sierra, or mountain region. Weil, et al, Area Handbook for Ecuador (1973). Temperature in the Costa is uniformly high, averaging eighty degrees Fahrenheit. However, the climate toward the south is mild due to the cooling influence of the Peru (or Humboldt) current. The rainy season is from December to April or May. Price Waterhouse, Doing Business in Ecuador at 1-2 (1981); Banco Central del Ecuador, Invest in Ecuador at 3-5 (1980) (hereinafter cited as Invest in Ecuador). The most likely site in terms of Pacific coast location and availability of land is Manta, approximately 200 kilometers north of the industrial "capital" of Guayaquil. However, infrastructure there would presently be a problem. Interview with attorneys Eduardo and Antonio Granda Centeno, Sharon Villarosa, U.S. Embassy, and Robert Shipley, U.S. Consulate, May, 1984.

2. Infrastructure

Infrastructure development is an important part of government investment. The constitution reserves potable water, electric power and telecommunications as economic activities of the state, although they may be delegated to private enterprises. Ecuadorian Const., art. 46 (1978). Under the National Development Plan for 1980-84, key undertakings are modernization of the railway system, port construction, water, irrigation and sewage systems, and other waste resource programs. Business Int'l Corp., Investing, Licensing and Trade Conditions Abroad - Ecuador at 4-5 (1982) (hereinafter cited as ILT); see also, Banco Central del Ecuador, Infrastructure for Industry (1981) (hereinafter cited as Infrastructure).

Fifteen thousand miles of all-weather roads connect all major ports and towns. Most movement of freight and passengers occur on these roads. Rail transportation plays a minor role. The main line runs from Guayaquil to Quito, and has been out of service for two years. Dept. of Commerce, supra, at 15; Invest in Ecuador, supra p. 1, at 17; Weil, supra p. 1, at ix.

There is good telephone service within and between the major cities. There is also good communication with foreign countries by telephone, telegram and telex. Price Waterhouse, supra p. 1 at 8. More critical for a nodule processing plant, Ecuador's gross hydroelectric potential is 90,000 megawatts. Its development is one of the top priorities of the present National Development Plan. The Ecuadorian Electrification Institute's (INECEL) program projects the installed capacity between 1978 to 1985 to be 2000 megawatts. The present supply in Guayaquil is only adequate. ILT, supra p. 2 at 4-5; Dept. of Commerce, supra p. 2 at 15; Invest in Ecuador, supra p. 1 at 19; Infrastructure, supra p. 2 at 3-5.

3. Population/Language

In 1981, the economically active population was approximately 2,808,159 (32 percent of the total population). Infrastructure, supra p. 2 at 2. Unemployment and underemployment are high with the latter estimated to be 60 percent of the rural population and 40 percent of the urban population. Price Waterhouse, supra p. 1 at 8. Unskilled labor is plentiful, but skilled workers and technicians are scarce. Other labor problems include high absenteeism, turnover and growing labor militancy and strikes. ILT, supra p. 2 at 17.

Labor relations are principally governed by the Labor Code (Codigo del Trabajo), and are under the jurisdiction of the Ministry of Labor. Labor laws are closely supervised by the government and any doubtful applications are resolved in favor of the employees. Price Waterhouse, supra p. 1 at 53-62; see, Banco Central del Ecuador, Labor Legislation (1981). The language of most of the population in urban areas is Spanish.

After independence from Spain in 1822 and formation of the republic in 1830, Ecuador developed politically under mostly conservative governments that alternated with military regimes. Each government tended to represent particular interests rather than the whole nation. As a result, since independence, Ecuador has had 52 presidents, only 13 of whom served full terms.

However, the governments have generally been law oriented and have not introduced changes drastically. Ecuador is a republic with capital city in Quito. Price Waterhouse supra p. 1 at 2; 1 Encyclopedia of Third World Countries at 519 (1981).

a. Structure of Government

Under the present constitution, sovereignty resides in the people and is exercised through three branches:

- (1) The executive is headed by the elected president with twelve cabinet members. The latter are freely appointed and removed by the president. Const., 2d Part, Title II.
- (2) The legislative branch is a unicameral body called the National Congress.
- (3) The judicial consists of a Supreme Court, various special purpose courts and lower courts. Const., 2d Part, Title III.

The voting or electoral function is considered a fourth branch. Vela, supra p. 9 at 2.

Ecuador is a unitary state. It is divided into provinces, cantons and parishes only for administrative purposes. There are twenty provinces, headed by governors who are freely appointed and removed by the president. The governors are directly under the Minister of Government and represent the president in the province. Their function is purely administrative and executive, and subordinate to the central government. There are also provincial councils (Consejo Provincial). Their functions are the maintenance and development of culture, education, communication and other public services; coordinating the activities of municipalities within the province; and informing the central government of budget expenditures. They are funded by the central government and taxpayers. Id. at 4; Weil, supra p. 1 at 189, interview with national government officials, May 1984.

The canton or municipality is an autonomous political organization whose purpose is the local common welfare. It is governed by the Law on Municipal Government (codified in the Official Register 331 of 10/15/71). The provincial capitals are headed by elected mayors; other cities have presidentes. There are also municipal councils whose members are elected by popular vote. Interview with national government officials, May 1984.

The parishes are primarily rural areas governed by an elected parish council. The council is responsible for public works and services. Weil, supra at 189.

The basic purposes of the municipal government are to provide for material well-being; plan and promote development; and promote nationalism, civic responsibility and confraternity. Vela, supra p. 9 at 4. Its functions include:

- (1) The establishment of water and sewer systems.
- (2) The construction, maintenance and cleaning of street, parks, lighting, etc.
- (3) The collection and processing of garbage and trash.
- (4) The control of food supplies.
- (5) Policing, morality and customs.
- (6) The authorization of operations of local industries, businesses and professions.

Id. at 4-5.

However, all its functions may be preempted by the national government. Interview with national government officials, May, 1984.

To fulfill its purpose, the municipality may expropriate lands by declaration of public utility and payment of a price. Id.

b. Legal Framework

The constitution is the supreme law of the land. Decrees, ordinances, provisions and international treaties that modify or oppose the constitution in any way is void. Const., art. 137. However, the enforcement of the constitution is only partial and conditional. The guarantees are applicable to the judicial and executive branches, but not the legislative or electoral branch. Vela, supra p. 9 at 1. Supreme power rests in fact with the president. Id. However, in the 153 years since the formation of a republic, Ecuador has had seventeen constitutions, only five of which were in effect for more than ten years. Nevertheless, the last four constitutions (of 1945, 1946, 1967 and the current 1978) have no major differences with respect to the guarantees and rights, and the structure of the state itself. The differences apply to political and technical questions, and those dealing with the level of development. Id.

The Civil Code in theory, is a "systematic and harmonious set of general principles and specific rules governing legal relations among private persons." It is the heart of private law including contracts, domestic relations, damages, restitution, inheritance, legal personalty and torts. It is generally consulted as a source of general principles serving to fill in gaps in other legislation as does the common law in

Anglo-American jurisdictions. Karst and Rosenn, Law and Development in Latin America at 45 (1975). There is heavy emphasis upon freedom to contract, the sanctity of private property (especially real property), and the family as the basic societal unit. It has been criticized as serving the European-oriented upper class which paid little attention to the needs of the illiterate, improverished masses. Id. at 47.

National laws are promulgated by official decrees. Provincial councils and municipalities issue ordinances. Price Waterhouse, supra p. 1 at 2. All decrees, resolutions, agreements, international conventions, treaties, concessions, certain judicial acts requiring broad publicity and the constitution are published daily in the Official Register (Registro Oficial).

II. Property Rights

A. Generally

Tangible things including lands, mines and things which are permanently attached to them, such as buildings, are classified as real property. However, the products of and things accessory to real property, such as plants in the field, timber, fruits or the trees, etc., are considered personal property. Civil Code, arts. 602-17; Vela, supra at 23. In particular, Article 37(46) reserves to the national government control over all natural resources - especially minerals - unless laws to the contrary specifically delegate control to a private entity. It is this article which forms a basis for the claim that processing of nodules would thus be controlled by the national government, even if the minerals - the nodules came from outside the country. Interview with government officials, May, 1984. The law could clearly be so read, though it is hard to imagine it was passed with the intent to regulate processing of any but Ecuadorian minerals.

Ownership is a real right in a tangible thing, to enjoy and dispose of according to the provisions of law and respective of the rights of others. Civil Code, arts. 618-22; Vela, supra at 223-24.

Things which nature has made common to all men, such as the high seas, are not susceptible to ownership and no nation, corporation or individual has a right to appropriate them for itself. Their use and enjoyment are established among individuals of a nation by that nation's laws, and among the various nations by international law. Civil Code, arts. 618-22; Vela, supra at 223-24.

B. Constitutional Guarantees

The constitution of 1978 that is presently in force, as well as the previous ones, guarantee the right to property ownership and establish its social function as the increase and redistribution of income that will permit the entire population to share the benefits of wealth and development. Const., art. 48. Confiscation of property is prohibited. Const., art. 47. Expropriation may be legally carried out for reasons of public or social purpose, by "just indemnification" to the owner. *Id.* Payment must be made on the basis of assessed valuation. Vela, *supra* p. 9 at 222. Municipalities may condemn, reserve and control areas for future development of urban centers to effectuate the right to housing as guaranteed in the constitution, art. 19 sec. 13. Const., art. 50.

The constitution of 1967 also states that no private individual may enrich himself by increased value due to public works or improvements, and must therefore contribute to the costs of those works which benefit his property, in proportion to the increase in value. Const. of 1967, art. 54; Vela, *supra* at 222. This is essentially a form of value recapture and assessment.

The state may limit the property rights of foreigners in certain zones. Const., art. 18. In particular, foreigners may not be owners or possessors of real estate within 50 kilometers of the national boundaries and coasts without special authorization. No authorization may be granted in areas classified as reserved areas or zones. The president may make exceptions in individual cases, by decree, according to one expert, but only according to law and, in certain reserved areas important to national security, only with the advice and consent of the National Security Council, which the president chairs. Constitution, Article 12(18) and National Security Law, January 1983, Articles 50 and 51. Interview with government officials. *Id.* These restrictions are presently regulated by the Law on Foreigners, art. 2. (Published in the Official Register of 12/28/71.) Vela, *supra* at 222.

C. National Property

Property may belong to private individuals or to the state and other public entities. That which belongs to the public entities is called national property. Perpetually snow-covered peaks and the areas situated at more than 4500 meters above sea level have been declared national property of public use. Legal and free easements for transit across lands through which access is easiest to these zones are established. Construction of roads, railroads, cable cars or other means of public transportation is considered of public use and expropriations necessary therefor may be made. Decree 390 of 8/31/63, published in Official Register 67 of 9/28/63; Vela, *supra* at 149.

III. Land Use Controls/Plans

The laws of Ecuador dealing with the environment and land use are not only in some flux, but they are subject to considerably different interpretations. This is particularly true of the mining and environmental laws, and the national planning laws. It is worth bearing in mind that Ecuador, as a developing country, hasn't a long history of experience with such laws, and, as a civil law country, much is left to interpretation and discretion. Not only is there some disagreement as to the applicability of the country's mining laws, but also as to the most logical procedures in getting through the applicable laws, which are themselves general in nature. Therefore, in this section as well as those which follow on mining and the environment, we have tended to rely on interpretations and views expressed by government officials and practicing lawyers who are generally in perfect agreement on the content of the laws (all of which are in Spanish, some of which we have translated) but who are often far apart in their interpretation and applicability to a manganese nodule processing plant. Interviews with government officials and attorneys at Fabian Ponce and Associates, and attorneys R. Bustamante and Manuel Rosales.

At the outset, it is worth noting that the local plans and laws roughly outlined in the sections following part A (below) are probably inapplicable to a nodules processing plant in Ecuador because (1) as noted previously, the most logical site, north of Guayaquil, appears to be outside the jurisdiction of a "planned and zoned" local government, and (2) applicable national laws would almost certainly supersede such local laws, if they were passed.

A. National Development Plans

National development plans are general targets and strategies for government investment, rather than zoning schemes. They are drafted and executed by various public sector offices and agencies under the direction of the National Development Council (CONADE; formerly, the National Board on Economic Planning and Coordination or Junta Nacional de Planificacion y Coordinacion Economica). Among its requirements: the treatment of wastewater should the Ecuador Institute of Hydraulic Resources deem it necessary. Water Laws and Regulations, August 1983, Title VII, Article 40. Interviews with government officials, May 1984.

Ecuador has had several development plans in its recent history. The most recent one is the Plan Nacional de Desarrollo for 1980-84. The six volume, 1,000 page plan (signed into law on 3/18/80) has three global objectives: democratic institutionalization, economic development and social justice. The first goal is acknowledged as the "most important task." Levy

and Mills, The Challenge to Democratic Reformism in Ecuador at 23 (1981). The second goal of economic development focuses on agrarian improvement and decentralized development to improve the rural quality of life. *Id.* at 24. Social justice problems to be addressed are underemployment, housing, health, education, and cultural improvements. *Id.*

This plan envisions \$14.5 billion in expenditures, 60 percent to come from private sources. There are forty fundamental projects which stress integrated rural development (16.1%), social improvements (34.1%), energy projects (31.9%), infrastructure development (11.4%), and industrial projects (6.5%). *Id.*

One account describes the plan as a set of targets and priorities rather than a "detailed blueprint." *ILT, supra* p. 2 at 5. Another account describes its inherent weaknesses. Its desire and commitment to diversify agricultural exports entails a greater burden on the national treasury through government loans and tariffs, which in turn, exert inflationary pressures and frustrates the social reform programs. Levy, *supra*, at 44. In addition, Ecuador has no control over world trade conditions. *Id.*

There are also yearly "operative plans," which establish investment priorities and contain a more realistic appraisal of public finances. However, government business is conducted through the national budget for a given year and not the operative plan. "Government almost always overshoots its spending targets." *ILT, supra* at 5.

Previous plans have been described even more unflatteringly. The 1964-73 plan has been called a "disappointing irrelevance" with negligible impact on economic development. Zuvekas, Economic Planning in Ecuador: An Evaluation, 25(4) *Inter-American Econ. Affairs* 39, 39-40 (1972). The same source labeled related regional planning as "primitive." *Id.* Another commentator criticized the plan's "relatively ineffective degree of implementation" before "gradual passage to oblivion." Bromley, Development Planning in Ecuador at 89 (1977).

The national plans have been characterized by an over-concentration on the mechanics and bureaucracy of planning, and a lack of commitment to implementation. Often the paper plan was an end in itself. *Id.* at 68, 69. It reacted to problems and maintained the status quo rather than attempting to initiate change. A further problem has been the lack of coordination with local efforts. R. Moore, Urban Problems and Policy Responses, 6 Latin American Urban Research 181, 193-94 (1978).

These difficulties have been attributed to a combination of continual economic uncertainty, chronic political instability, strong local and inter-regional rivalries, and marked social division. The difficulties make Ecuador a particularly difficult country in which to undertake long-term planning. Bromley, supra at 65. Moreover, the motive for undertaking planning was often international pressures rather than "any serious Ecuadorian belief in the virtues of planned development." Id. In many cases, the preparation of comprehensive development plans was a precondition for the receipt of economic aid. Id.

B. Local Schemes

Municipal regulations normally specify the areas designated for the location of industries. Price Waterhouse, supra p. 1 at 31. In Guayaquil, there are construction codes which divide the city into four separate zones: commercial, residential, industrial and suburbio. However, "while residential zones are delineated, industrial zones remain vaguely defined. (Departamento de Planeamiento Urbano, 1975:42)." Moore, supra p. 25 at 199.

Municipal-level plans in general, have also been criticized as creating confusion and not resolving urban problems. Guayaquil had promulgated three plans (1967, 1972, 1973) for coordinating urban growth and development, but they were only partially implemented. These plans have been criticized for: (1) concern for physical technical development without recognition and analysis of social, political and economic necessities (e.g., housing shortage; uncontrolled growth of suburbio, the squatter settlements; lack of urban services; and unemployment); (2) vagueness - e.g., localization of growth zones were proposed but not delineated; (3) lack of long-range planning and data gathering. Id. at 198-99.

Acknowledging the apparently ineffective record of urban programs, a concerted effort to create a coordinated, comprehensive plan of urban development was begun in 1974 under the local direction of the Department of Urban Planning. It received a national financing and direction through the National Planning Board; and was well-endowed with funding from national and international agencies. Some initial results include:

1. A detailed inventory of land use patterns in the city and surrounding urban areas.
2. A catalogue of existing urban legislation and administrative agencies.
3. Extensive document of recommendations on the city's problems.

Id. at 200. Of interest to a manganese nodule processing consortium was the designation of four areas for industrial expansion. Id.

C. National Industrial Parks Program

The purpose of the program is to decentralize industrial expansion (outside of Quito and Guayaquil), attain well-balanced development of all regions of the country, and prevent chaotic growth of urban centers. The Law of Industrial Parks (1976) was enacted to regulate the existence and performance of industrial parks. These are the rational groupings of industries situated in appropriate locations having infrastructural support, such as power, water, sewage, streets, telephone, labs, warehouses, administrative and maintenance centers, etc. They operate as joint public and private enterprises, or exclusively with private capital. Banco Central Del Ecuador, Infrastructure at 26-27; Price Waterhouse, supra p. 1 at 108-09.

Promoting new industrial parks, planning and preparation of projects for zoning, conglomerates and industrial parks are among the functions of the Industrial Development Center of Ecuador (El Centro de Desarrollo Industrial del Ecuador-CENDES). CENDES, established in 1962, is a private law state institution which acts as an industrial development corporation. While maintaining close ties with the Ministry of Industries, Commerce and Integration, it operates as an independently administered institution responsible for promoting and furthering industrial development. CENDES, supra at 3. This is discussed in the section of this report dealing with the economic and business climate in Ecuador. Banco Central del Ecuador, CENDES at 11. They participate in policy formulation and provides technical assistance for the installations and operations of such projects. Id.

In 1981, there were industrial parks in Cuenca, Ambato, Riobamba, Ibarra and Tulcan. Guayaquil and Quito have industrial areas assigned by municipalities. Infrastructure, supra at 26-27.

The Law of Industrial Development does not address industrial zoning or siting. Instead, its provisions seem to fall into three categories: (1) classification of industry according to its contribution to national interest - i.e., economic development, deconcentration of industrial activities and areas, and Latin American integration; (2) establishment of tax and other benefits for each classification; and (3) establishment of obligations and penalties. Vela, supra p. 9 at 165-68.

This law serves as a basis for all industrial enterprises which are defined as those which "engage in processing raw materials or semi-manufactured products into final or intermediate articles." *Id.* at 164. It is interesting to note that special regulations are enacted for each industry considered to be of sufficient importance and complexity - e.g., petrochemicals, automotive, electronics, tourism, construction and transportation. See, id. There appears to be some conflict over which law principally governs a nodules plant proposal: the Law of Industrial Development, or the Mining Laws, to which we now turn.

IV. Mining Legislation

It is not at all clear that the mining laws of Ecuador apply to the likes of freestanding mineral processing. However, certain experts in the government maintain that they do. Interview with government officials in Quito, May 1984. On the other hand, several attorneys in private practice are not so sure. Interviews with R. Bustamante and with the firm of Fabian Ponce and Associates, May 1984, in Quito.

The basic provisions regulating mining activities are contained in the Constitution, the Civil Code and the Law on Mining Development (Ley de Fomento Minero, Supreme Decree 101, published in Official Register 484 of 1/1/74 and reissued August, 1984). Vela, supra at 127. The law also contains reasonably substantial sections providing for environmental protection - another reason the government would like to see it applied to a nodules plant. There is a draft of a mining law which has been pending before Congress for two years. Bureau of Mines, Mineral Industries of Latin America (1981). Interview with government officials, May, 1984, in Quito.

The president has the power to establish mining policy. Its execution is the responsibility of the Minister of Natural Resources and Energy. The minister is also the special judge on mines, with exclusive jurisdiction for hearing, processing and deciding petitions, disputes, claims and other juridical matters of defacto questions relating to mining. Vela, supra at 127.

Mining activities in the Law on Mining Development are described in Title II as follows:

1. Prospecting: includes surface studies designed to establish indicia of mineral deposits.
2. Exploration: includes the operations following prospecting designed to establish the reserves and fineness of minerals.

3. Explotation: covers the operations of preparing and developing the mines and the extraction and transportation of minerals to the processing plant.
4. Processing: includes crushing, grinding and purification and the metalurgical process.
5. Smelting: includes the technical processes designed to separate the metals from the minerals so that a high grade of purity may be obtained.
6. Refining: includes those processes designed to give metals a grade of purity which permits their use in industry.

Vela, supra at 127-29.

However, if the laws were applicable, the provisions are as follows:

The Law on Mining Development (August 1984 edition) commences at Article 1 with a recitation of the constitutional dictum that mines and mining activities are under the inalienable control of the national government. Article 3 then tracks the constitutional exception which, under proper circumstances, would permit the national government to delegate mining to private commercial interests. Interview with governmental officials in Quito, May 1984. Articles 6 and 7 set out a division of power to make such exceptions (and mining policy generally) between the President and the Minister of Natural Resources and Energy. But in order to obtain such an exception, it appears to be necessary for a foreign business entity to first enter into a contract with the national government.

The source for such a requirement appears to be articles 23 through 27 which discuss control of the "beneficio de minerales" in terms inclusive of smelting and processing (Article 23) and then give to the Director General of Geology and Mines and the Minister of Natural Resources and Energy authority over such mineral processing. In fact, though much of the law appears to discuss processing in conjunction with other mining activities, leading to the conclusion that processing is covered only if Ecuadorian minerals are being processed, the aforementioned articles deal with processing without such mention, and hence the interpretation that the Mining Law so governs. Title IV of the Mining Law then sets out the requirements for making such a contract with the national government, Article 56 of which refers to "beneficio" but only in conjunction with other mining activities. Article 58 then sets out the need to present plans for mining activities, arguably including processing, and including such matters as financing, technical processing, and so forth, to the Minister for Energy and Natural Resources for approval.

The aforementioned provisions, if applicable, already represent the most direct controls on a nodules processing plant. More critical, in the absence of a major environmental code, is Article 68 of the Mining Law which specifically requires the contract between the national government and the processor to adopt necessary measures for the protection of flora, fauna and other natural resources, and to prevent the pollution of water, air or land. As a tradeoff of sorts, Article 77 gives the minister the power to compulsorily acquire (condemn) land on behalf of the private consortium for a processing plant site, providing all is set out in the aforementioned plans submitted to and approved by the minister. Interview with government officials in Quito, May 1984.

Concessions for mining exploitation to individuals or companies appear to be granted on the conditions of just and equitable participation in the earnings of the company, obligation to invest a prudent amount of profits for the benefit of the national economy; nontransference of rights to third parties without express authorization of the state. Furthermore, if the exploitation and processing contract is not entered into within 120 days from the expiration of the exploration contract, the state may take over the respective area unless there is a proven lack of productivity. Preparation and construction of the mine, ore processing plant and related works must start within six months from the contract registration date. The contractor must provide a guaranty equal to one percent of the investment estimated up to the start of production. The contractor or associate must justify his technical and financial capacity and present feasibility studies and work plans prior to entering into the contract. Vela, supra at 130.

Other responsibilities of the contractor or associate include the technical, administrative and economic responsibility of the contract, and the authority to appoint managers, technical and administrative personnel and other workers. The personnel must be Ecuadorian nationals in the following proportions: 95% laborers, 90% administrative, 75% technical. He is the employer with respect to the laborer. They must also report their activities and results to the Bureau of Geology and Mines.

Finally, natural or juridical persons who exploit, process, smelt or refine minerals must apparently sell the final products in the national market in amounts sufficient to satisfy the internal needs of the country. Only when production exceeds the national requirement of smelting and refining may the state authorize exports of the surplus. Marketing of radioactive mineral and others considered strategic is within the exclusive power of the state. Vela, supra at 127.

V. Water Legislation

Aside from the water pollution directives in the Mining Law discussed in the previous section, there is a specific Water Law which governs water use in Ecuador, Law of Water, August 1983, and which has specific conservation and pollution provisions. In addition, the pertinent provisions of the Civil Code, the Law on Municipal Regime and the regulations of the Ecuadoran Institute of Hydraulic Resources (Instituto Ecuatoriano de Recursos Hidraulicos - INERHI) (Supreme Decree 1551, Official Register 158, of 11/11/66) are pertinent.

A. Water Rights and Obligations

All waters are national property. Individuals may only enjoy the right to use of them, and in a manner not detrimental to others. The use must conform to legal regulations under control of INERHI and be subject to taxes. Except for household use, the right to use is obtained by grant for the particular purpose. Vela, supra at 154.

The right to use is understood to mean the nontransferable administrative authorization to use waters pursuant to legal requisites. The use is accompanied by authority to construct works and to establish easements necessary to carry out and enjoy the right. However, grantees may not object to additional interested parties using the same water source, provided the third parties' actions are not detrimental to the grantee's use. Id.

INERHI is responsible for the regulation and limitation of water use by grantees. All pollution of waters which may affect human health or the development of flora and fauna is prohibited. Id. at 154-55.

The beneficiary of a right to water use is obligated to construct works for water tapping, piping, supply, measurement and control so that only the waters granted are taken. These works may not be changed without INERHI's permission. The state and other public entities will recover the value of hydraulic works, and their cost of operation and maintenance paid with their own funds from the beneficiaries using the waters. Grants for drinking purposes, production of electric power for public service and industrial enterprises generating the water in their own plants are exempt from payment. Id. and Titles III and IV, Water Law.

To apply for a grant to use water, the application must be submitted to INERHI with the following data: (1) name of river or other water source and its location; (2) the required flow and place to be harnessed or diverted; (3) the purpose for which water

will be used; (4) names and domiciles of known users; (5) works and installations in order to use the water; (6) period in which such works will be carried out; and (7) studies and technology plans.

The agency or district head evaluates the application and gives public notice. If no opposition arises within thirty days, and the application is otherwise acceptable, the right of use will be granted. If opposition arises, then a conciliation meeting will be called. *Id.* at 156, Title XVIII of the Water Law and Regulations Issued under Decree No. 40.

Grants for industries are given for a determined period. They are subject to the following requirements:

1. They must not interfere with other uses.
2. The waters must be sufficient in quantity and quality.
3. The studies and works necessary for their use must have been approved by INERHI.

When available waters are insufficient to satisfy multiple requirements, priority will be given to uses which best serve the country's eco-social interests, in the following order:

1. To towns for domestic and animal use.
2. For agriculture and livestock.
3. For energy, industry and mining.
4. Other.

The order may vary for emergencies. (Article 34, Water Law.)

INERHI may cancel a grant if the user does not make use of it or uses it for purposes other than the specific one for which the grant was extended. It may also terminate if the water flow diminishes in such a manner as to make its use impossible.

B. Water Conservation and Pollution

In addition to allocating water rights, the national water law also sets out provisions with respect to conservation, pollution and wastewater treatment. Article 22 prohibits the pollution of water that would affect human health or damage flora and fauna. Policies and regulations to implement the article are made the responsibility of the Institute of Hydraulic Resources and the Ministry of Public Health. Article 20 and 21 require

users to use water with maximum economy and efficiency. Finally, the water law ties in the aforementioned state plan in Article 40 by requiring industrial users to use water only for activities and in accordance with that plan, and to treat wastewater if the Institute for Hydraulic Resources deems it necessary.

The regulations issued under Decree No. 40 create a consultative council for water as a "Superior Administrative Organism" to apply the Water Law in consultation with the aforementioned Institute. (Art. 2/Regulations.) After 70 or so articles dealing with administration, financing, and the like, the regulations set out in more detail the various national government agencies with responsibilities for water conservation programs - Forest Service, Agricultural Reform and Colonization Institute of the Ministry of Agriculture and Cattle - and declares with some specificity what general classes of pollutants are illegal. All discharging users must periodically analyze their wastewater and send reports to the Institute for Hydraulic Resources for review and, if called for, fines. Regulations, Title VIII, Cap. 1 and 2, Articles 83-92.

C. Territorial Waters

The bed and subsoil of island and territorial seas which extend up to 200 miles from the shoreline of rivers, lakes, ravines, marshes and other permanent water courses or reservoirs are also national property for public use. Vela, supra p. 9 at 154 and Water Law Title VIII.

The Fishing and Development Law (1974) gives the state exercise of sovereignty over territorial waters and the maritime fauna and flora. Art 1. It defines the continental and insular shelf or base as the submerged lands contiguous to the national territorial sea. Civil Code, arts. 2, 625; Vela, supra p. 9 at 271.

VI. Environmental Laws

The principal organic law for environmental protection is the Law for the Preservation and Control of the Environment promulgated in 1976. It provides for an interministerial group to make or review an environmental impact analysis of a proposed project. Cap. II, art. 5. It has been suggested that this might be an appropriate way to commence the approval process for such as a manganese nodule processing plant. Interviews with Dr. Manuel Rosales, attorney, and the law firm of Fabian Ponce and Associates, Quito, May 1984. Supreme Decree 374. B.M. Carl, Latin American Laws Affecting Coastal Zones, 10 Law. Am. 51, 76 (1978).

Other language expressing environmental concerns is generally contained within other legislation. For example, the Health Code (Supreme Decree 188, published in Official Register 158 of 2/8/71) consists of three books: I. General Health; II. Actions in the Field of Health Protection; and III. Jurisdiction and Competence, Proceedings and Penalties. Vela, *supra* p. 9 at 268. Title I of Book II deals with environmental health and has the following chapters: I. General provisions; II. Potable water supply; III. Elimination of human wastes, sewerage and rainwater; IV. Toxic substances or those dangerous to health; V. Collection and disposal of garbage; VI. Ionizing radiation; VII. Urban development; VIII. Environmental (housing) health; IX. Industrial and other establishments; and X. Control of disease-transmitting fauna harmful to man. *Id.* at 269 (emphasis added). Chapters VII, VIII and IX may be applicable to a manganese nodule processing plant.

Another provision is found in the conventions on the territorial seas which establish the 200 mile limit. These conventions also establish the state's obligation to "protect maritime resources by preventing their irrational exploitation to the point of exhaustion" and recognize "the uselessness of such wealth that may be caused by pollution." *Id.* at 271.

The Law on waters discussed above also prohibits "all pollution of waters which may affect human health or the development of flora and fauna." *Id.* at 155.

Existing water and air pollution controls have reportedly been fairly loosely enforced due to the principal national interest in economic development. However, growing concern with environmental quality will probably result in more rigid enforcement, especially in urban areas. Recall that mining companies are specifically enjoined in the mining code to provide adequate environmental safeguards, including protection of wildlife.

Other environmentally sensitive laws, such as the Law for Preservation of Reserved Zones and National Parks, would apply only if a processing plant were to be located in or next to such a zone or park.

VII. Ports and Related Laws

Specific national legislation governs ports in Ecuador. Of perhaps equal importance, however, is the reportedly negative attitude of the military in Ecuador to the location of a foreign based company in a coastal area, which the military regards as strategic for defense purposes. Interview with firm of Fabian Ponce and Associates, Quito, May 1984.

A. The General Law of Ports

1. Ports

Along the 620 mile coast, a number of port cities have developed. Guayaquil is the principal port and largest city which handles approximately 60 percent of the foreign trade volume. Esmeraldas, Manta and Puerto Bolivar are rising in importance due to increasing congestion and surcharges at Guayaquil. U.S. Department of Commerce, Marketing in Ecuador at 15 (1982). The distances from the three manganese nodule mining sites used in the DOMES study range from 2898 nautical miles to 4342 nautical miles.

Each port is linked to towns by all weather roads, and is of close proximity to airports. Lloyds of London Press, Ltd., Ports of the World (1982) (six kilometers for Manta and Puerto Bolivar, 16 kilometers for Guayaquil, and 20 kilometers for Esmeraldas). The largest vessel presently facilitated at these ports are 180 meters length overall and ten meters draught. However, government publications list the maximum draught at Guayaquil as being 33-45 mts. Infrastructure at 18-19. Id. Guayaquil has full repair and other services. However, the other ports have only minor or no facilities. Id.

The General Law of Ports (August 1983) covers all aspects of port regulation, policy and control (Art. 1). Responsibility is divided among the National Council of Merchant Marine and Ports, the Directorate of Merchant Marine and Beach, and the Port Authority. Art. 2. The first, the council is made up of the heads of various key ministries and other governmental groups, including such as the Minister for Public Works and the Minister for National Defense. It is the council which passes all port regulations, authorizes all uses, and levies all taxes and tariffs, Art. 4, though there appears to be some overlap with the directorate on technical and procedural rules and regulations. The general tenor of the law makes it clear that there will be no port facilities of the type needed for a processing plant, surely if located outside Guayaquil and in any bay that might be construed to be a port, without the permission of the council and under the administration (broadly speaking) of the directorate.

Detailed regulations have been published, delegating much specific authority to the various captains of existing ports. Code of Maritime Policy. While much of the code deals with such matters as cargoes and pilots, specific regulations govern the construction of docking facilities both in ports and elsewhere on the Pacific coast. Title III.

B. National Security Laws Affecting the Coast

The National Security Law, January 1983, requires special permission from the president of Ecuador in conjunction with the National Security Council for any foreign-based development within 50 kilometers of the coast. If the area is a security zone as decided by the Council, no permission for such development is possible. Articles 50 and 51. If in a port area, such permission is apparently sought through the Port Captain. Code of Maritime Policy. The matter of such permissions may be complicated as there appear to be some international conventions between coastal South American states to which Ecuador is a party, declaring many parts of the coast to be special zones for military defense purposes. January 24, 1956 and November 18, 1964 entries in Official Register, Decrees therein.

VIII. Conclusion

In general, Ecuadorian economic laws aid rather than restrict industrial investments. There is a pattern of enacting a special set of economic laws for each industry considered of sufficient importance. These special provisions tend to confer benefits rather than set limitations. A new industry of the scope of a manganese nodule processing plant may also trigger its own legislation. If the mining law is any indication of the possible type of law that could be enacted, it would provide for the contractor's rights to expropriation of lands necessary for installations and waste disposal, and the rights to "indispensable" easements. On the other hand, the state may reserve the right to carry out the processing activity through contracts, and limit its distribution or export.

It is unlikely that a site of the size needed for a manganese nodule processing plant in Ecuador is available in Guayaquil, so that a relatively undeveloped site on the Pacific Coast is probable. It is therefore apparent that no local land use scheme will be applicable to such a project in Ecuador.

The principal applicable laws will be national in character, having to do with mining (if applicable, as noted in a previous section) water and environmental impacts.

The national mining legislation, containing as it does provisions for a measure of environmental assessment and control, will be the principal law applicable to a manganese nodule processing plant in Ecuador - if the mining law is applicable at all to a free-standing processing plant unconnected to a mineral extraction operation in Ecuador. The existing law quite clearly applies to processing and refining, and are, if applicable, clearly under the control of the national government. A permit -

and an exceptional one at that - will be necessary from the Minister of Natural Resources, after first entering into a contract with the national government. This entails the need to present plans for the processing plant to the Minister for Energy and Natural Resources for his approval. The consortium will need to set out measures designed to protect the flora, fauna and other aspects of the national environment, and to prevent air or water pollution, all of which will be rolled into the aforementioned contract. If necessary, the minister will condemn the land necessary for the plant. Care must be taken at this point to avoid application of mining law provisions which prevent export until national needs for the extracted mineral are met. While it is highly unlikely that Ecuador will have an indigenous need for the minerals produced from nodule reduction, nevertheless this provision should not even be triggered, given the nodules come from outside Ecuador.

Under the Ecuador water law, the consortium will need specific national permission to use water in the nodule processing process. This appears to come from the National Institute of Hydraulic Resources. Such a permit will not be forthcoming without setting out in the application for water use both the amount and nature of the use and the methods undertaken to prevent water pollution.

The water law specifically requires maximum efficiency and economy in use. Industrial users are limited to uses consonant with the national plan. Finally, all discharges must be periodically analyzed by the industrial user and reports submitted to the Institute for review.

Aside from environmental provisions in other laws, some of which have been noted above, there are provisions for an environmental assessment of such as a manganese nodule processing plant.

Finally, it is clear that national laws dealing with ports and port authorities will require that a port authority will have jurisdiction over any area which is suitable for a processing plant of the magnitude hypothesized by our study, and that therefore the jurisdiction of the National Council of Merchant Marine and Ports, as administered by the Directorate of Merchant Marine and Beach, and an individual port authority, will apply to both dock facilities and foreshore industrial use, if any. The most likely scenario is the appointment of a port captain to supervise such matters. Moreover, it is to be expected that the military will initially object to such a plant in what the military regards as a zone sensitive for national defense purposes.

F I J I

F I J I

I. Substantive Introduction

A. Scope and Conclusions

Fiji is one of the most highly-developed Pacific Island nations outside the United States and its territories. This, and the fact that its system of land use laws is roughly analogous to many other such island nations--Kiriboti, Tuvalu, Tonga, Vanuatu, Cook Islands, Western Samoa, the Solomons (12/5/83 interviewed George Neil, Suva), makes Fiji a good "model" for the Pacific Basin island states as well as, for further reasons of language and relative proximity, a good "pilot" study for the project.

The cumulative legal attitude in Fiji from a land use, property and environmental law perspective, is guardedly positive. There is little question that the national government would welcome an industry such as a proposed manganese nodule processing plant, and would be helpful in finding an appropriate location. However, the options are limited, principally by the Fijian town planning laws and their implementation, and the vast amount of land which is under the administration of the Native Land Trust for the benefit of native Fijians, who hold most of the land in Fiji. Because of the first--the town planning laws and their application to the main city of Suva on the most populous and developed island of Uiti Levu, as well as the heavy development of the non-native trust land there, no coastal site is really available nearby, as interviews with local lawyers and planners quickly make clear. Because of the second, development of any kind is largely in the hands of the Native Land Trust Board which, as appears below, has the power to act for the natives which control the bulk of the land area of Fiji. It is worth noting that the town planning scheme for Suva stops short of the harbor area where one would logically expect such a processing plant to be sited, but other provisional plans together with the absence of a coastal suitable developable parcel of the size needed for a plant, make it unlikely that such a plant could easily be sited in the Suva area. Indeed, as appears hereafter, one official with responsibility for national economic planning suggests that a relatively undeveloped bay in the next largest island of Vanua Levu (Sava Savu) would be looked upon with more favor. This, of course, raises the question put by a resident expert with an international organization: If one is going to go to a relatively undeveloped part of Fiji, thereby losing the infrastructure advantages of Suva, why bother with Fiji at all--why not pick a totally uninhabited island in someplace like Kiribati or Nauru where the impacts on at least the human environment will be virtually nil?

There are virtually no applicable environmental impact laws of a formal nature, though there is a formal Environmental Management Committee which is apparently housed for administrative purposes within the Directorate of Town and Country Planning. The Committee, which is interdepartmental, would almost certainly be convened to discuss the environmental impacts of such as a manganese nodule processing plant. Revisions to the Town and Country Planning legislation requiring an environmental impact assessment or statement are presently in the draft stage, though we were unable to secure copies on the ground that these were "confidential" within the government at this stage. In either event, the national government would attempt to persuade a developer to mitigate the effects of any adverse environmental effects which either the formal or informal process would disclose. This process apparently was already used (or is being used) to deal with a proposed copper mine and smelting operation southwest of Suva--the Namosi Copper Study--but this, too, is confidential and we were unable to obtain a copy.

This brings us to our last summary point: there are several sets of mining and mineral laws and regulations applicable to mineral development which are quite detailed in terms of operation procedures and protections, but interviews with appropriate officials make it quite clear they do not apply to a free-standing processing plant of the kind envisioned by this study, and so we do not discuss them in any detail.

What follows is a discussion of the applicable laws and regulations summarized above, based upon a random survey of the existing literature, selected Fijian statutes, regulations and town planning schemes, and interviews with nearly two dozen attorneys, planners and government officials in the Suva area conducted during a site visit in December, 1983.

B. Summary of Background Factors

1. Geography and Climate

Fiji is in the South Pacific, some 2,100 km. due north of New Zealand. There are 320 islands in Fiji located between 15 and 22 deg. S. latitude and 177 deg. W. and 175 deg. E. longitude. Pacific Island Yearbook, (Ed.) John Carter 14th Ed. p. 89 (1981). The total land area is 18,376 sq. km. most of which is found on the two largest islands of Viti Levu (10,400 sq. km.) and Vanua Levua (5,535 sq. km.). Suva is the capital and is located on Viti Levu some 1,960 air miles from Sydney, Australia, 5,611 from San Francisco, and 11,590 from Great Britain. Doing Business in Fiji, Price Waterhouse, p. 1 (1982).

Fiji's proximity to the manganese nodule beds of maximum commercial interest may be determined by referring to the Domes Baseline Sites map in the case study of the Philippines at p. 2. The distances between sites A, B, C, and Viti Levu are approximately 2,845 miles, 3,630 miles, and 5,075 miles respectively.

Fiji's weather is typical of a tropical island with all the advantages of a relatively constant temperature and humidity throughout the year. The southeast tradewinds blow year round but are more variable between Fiji's hottest months, November through April. Doing Business in Fiji, Price Waterhouse, p. 1, 1983. Of more direct concern to the placement of a large nodule processing plant and port facilities though, is the fact that Fiji is often visited by cyclones and hurricanes. Since 1875 Fiji has suffered more than 87 cyclones, 12 of which have struck the country since 1972. The destructive force of these storms and their regularity are certainly factors which must be taken into consideration before large scale capital investment begins. Fiji: The First Decade, Ministry of Information, p. 88 (1980).

2. Population and Language

The population was 612,046 as of 1978 census with approximately 44% being Fijian, 50% Indian, and the remaining 6% European, Chinese, or other Pacific peoples. Doing Business in Fiji, p. 2 (1983).

English is the official language but the use of Fijian and Hindustani are common also. Id. at 2.

3. Government

Fiji became an independent member of the Commonwealth on October 10, 1970. There is a Parliament consisting of a 22 member nominated Senate and a 52 member elected House of Representatives. The Cabinet is presided over by the Prime Minister and consists of 12 members (Ministers) and seven Ministers of State who are not cabinet members. The Ministers are appointed by the Governor-General on the PM's recommendation. These Ministerial positions are important since they administer all of the property, land use, and environmental laws that could affect the placement of the nodule processing plant.

The Queen is the Head of State, represented in Fiji by the Governor-General.

There are, two main political parties--the National Federation Party and the Alliance Party--which are presently in power. There are free elections and a constitution which guarantees fundamental freedoms and rights. Pacific Island Yearbook at 90.

Local government takes on two distinct forms--one for the Fijians, the other for the non-Fijians. The non-Fijian local government consists of City and Town councils. (Cap. 125 Local Government Act.) These councils are important for our purposes because they play a significant role in administering the major land use legislation in Fiji--The Town Planning Act. The Fijians, although subject to the central government, have their own administration based on the village (Koro), the district (tikina), and the province (yasana). The authority under which this system functions is the Fijian Affairs Board headed by the Minister of Fijian Affairs and Rural Development. Of greater importance is the Native Land Trust Board, a statutory body created in 1940 (Cap. 134 Native Land Trust Act) to administer all lands held communally by the Fijians. Any and all businesses relating to Fijian land must be approved by the Board.

4. Ports

There are three major ports of entry in Fiji; Suva and Lautoka on the island of Vitu Levu, and Levuka on Ovalau. All ports and wharves are administered by the Port Authority of Fiji, a statutory body created in 1975. (Cap. 181--Port Authority of Fiji Act.) These are all deepwater ports but are somewhat restricted in terms of available wharfage. Suva, with the largest wharf at 484 m. can only take vessels up to 42,000 tonnes. Id. at 109. The regulatory powers of the Board as they affect the siting of a manganese nodule processing plant are discussed infra, at 22.

5. Energy and Communications

Nearly half of Fiji's total energy consumption is derived from imported petroleum fuels, but the government has taken a major step towards self reliance by authorizing the Monasavu hydro electric scheme due to be completed in 1983. This project, as are all power stations, is owned and administered by the Fiji Electricity Authority. (The Electricity Act Cap. 180.) This hydro electric plant should provide about two-thirds of the electricity requirements of Viti Levu. Other alternate sources of energy being explored to complement the present diesel production of electricity are production of ethanol from sugar cane, geothermal sources, offshore petroleum explorations, and sea wave energy production. Fiji: The First Decade at 55-58.

Fiji's communications capabilities are grounded both in submarine telephone cables and satellite facilities. International communications has significantly improved since the installation of the Wailoku earth station in 1976. Fiji International Telecommunications, run by the Fiji Government and Cable Ct Wireless Corporation, maintain and operate the majority of the communication services. Id. at 84.

6. Investment Atmosphere

Fiji's policy towards foreign capital investment is specifically stated in its Eighth Development Plan 1981-85 in the chapter on Overall Strategy for Development. Section 3.2.03 states "Capital investment, both local and foreign, will be welcomed and encouraged during the D.P.8 period." To encourage and expedite the processing of an application from a foreign investor, the Government has attempted to to reduce the red tape by creating a single statutory body to assess all applications. The Business and Industrial Development Committee with representation from the Ministry of Commerce and Industry, Ministry of Finance, Ministry of Labor, Industrial Relations and Immigration, Ministry of Lands and Mineral Resources, and the Ministry of Urban Development and Housing and Social Welfare may provide, at least, approvals in principle, to enable the investor to proceed with his project. (Streamlining Government Procedures, Sec. 9.7.37, Fiji's Eight Development Plan 1981-85.)

So, the basic steps a foreign investor must take before seriously beginning negotiating for land or applying for business licenses or concessions are to:

- 1) Contact Ministry of Commerce and Industry and the Economic Development Board, to talk over the proposal. This ministry is dedicated to encouraging new industries and will assist the investor in planning his new project.
- 2) Then an eight-page Project Appraisal Information Form must be completed and submitted to the Business and Industrial Development Committee (B.I.D.C.) for approval.

Since all interested ministries will have then evaluated the project, once approval from the B.I.D.C. is obtained the foreign investor should encounter few difficulties in establishing his project. Guiding the Investor, Business News, February, 1978.

II. Property Laws

A. History

To completely understand the property laws and land tenure system of Fiji some history is necessary. The major ingredients of the present land tenure system were fixed when the Colonial Government issued the Deed of Cession in 1874.

Paragraph 4 of the deed states:

That the absolute proprietorship of all lands not shown to be now alienated so as to have become bona fide the property of Europeans or other foreigners or not now in actual use or occupation of some Chief or tribe or not actually required for the profitable future support and maintenance of some Chief or tribe shall be and is hereby declared to be vested in Her said Majesty her heirs and successors.

As interpreted by Governor Gordon, the colonial administrator, the paragraph required a strict adherence to native custom. In addition, he felt that the crown should act as a trustee for the natives to ensure that they did not alienate their land for immediate gain with no thought given to their long term interests. Ordinance VI, prohibiting the alienation of native land, was passed in 1875 and except for a short period between 1906-1908 has remained the law of the land. Ward, Ralph, Land Use and Population in Fiji, A Geographical Survey, pp. 115-117 (1965). The end result has been the creation of two entirely separate systems of land tenure: (1) land is held under the English concept of freehold and may be further divided in two classes: (a) alienated or freehold lands and (b) Crown lands and (2) native land is held under a traditional customary system of tenure with the matagali being the main land owning unit.

A Land Claims Commission was established to determine the validity of European claims and the extent of native land holdings. All claims must have been approved by the Commission before a Crown Grant was issued. Id. at 116.

B. Freehold Land

Freehold land (that land which is neither Crown nor native land) composes approximately 9.76% of the area of the colony. Land Use and Population in Fiji. This system of land tenure is, for the most part, the one with which we are familiar in the United States. The Fijian statutes which apply to the holding or alienation of this type of land are Cap. 137--Land Sales, Cap. 130--Property Law, and Cap. 131--Land Transfer.

The Property Law Act and the Land Transfer Act are basically statutory embodiments of the English common law concerning freehold property. Both Acts are administered by the Ministry of the Attorney General and contain provisions concerning deeds, leases, mortgages, future interests, covenants--implied and express, easements, tenancies and partition of land, profits a pendre, Crown Grants, certificates of title and land registration, procedures for transfer of title, adverse possession, trusts, and the jurisdiction of the Supreme Court to hear actions concerning the registration of land.

Cap. 137--The Land Sales Act, administered by the Ministry of Finance, is of greater significance to the foreign purchaser because it directly regulates his ability to buy property in Fiji. Section 2 of this Act defines non-residents as any individual who is not a citizen of Fiji or any company whose controlling interests are held by non-citizens. In Section 6, the Act specifically states that a non-resident may not purchase land without prior consent of the Minister unless total holdings be less than one acre. The Minister may refuse without reason to allow the non-resident to purchase property or he may specify any terms or conditions he feels necessary. There is no appeal from the Minister's decision. These provisions though, do not apply to Native Land or grants or leases made by the Native Land Trust Board. Section 7 of the Act also prohibits one non-resident landowner from selling to another non-resident without the Minister's consent. Here again the Minister may refuse without reason, set conditions, his decision is not appealable, and these provisions don't apply to Native Lands. The remainder of the Act deals mainly with taxation of profits made from sales of land and is as a consequence of little importance for our purposes. However, provisions of this act apply only to the sale of property. There appears to be no general statutory restriction on the leasing of freehold property to non-residents legally within the country, though the restriction resulting from the Native Trust and Native Trust Land Board legislation, discussed infra, is considerable.

C. Crown Lands

Crown lands constitute less than 7% of the land area in Fiji. These lands are administered by the Ministry of Lands and Mineral Resources which in turn derives its authority from Cap. 132--The Crown Lands Act. Section 2 of this act defines Crown Lands as meaning "all public lands in Fiji, including foreshores and the soil under the waters of Fiji, which are for the time being subject to the control of Her Majesty by virtue of any treaty, cession or agreement and all lands which have been or may be hereafter acquired by or on behalf of Her Majesty for any public purpose." All title to these lands or lands leased on behalf of the Crown are held in the name of the Director of Lands. Section 6 of the Act allows the Minister after consultation with the Cabinet to sell portions of the Crown Lands but it seems that this takes place only under extraordinary circumstances. Doing Business in Fiji, Price Waterhouse, p. 6 (1983). This same section also allows the Minister, with permission of the mataqali, the Native Land Trust Board, and after consultation with the Cabinet, to exchange Crown Land for native land wherever he considers such action to be expedient.

Section 10 of the Act is of particular interest to foreign investors because it empowers the Director of Lands to grant leases or licenses of portions of Crown Lands subject to the special directions of the Minister and the provisions of sections 21, 22, 25 and 26 of this Act.

Sections 21 and 22 are special provisions relating to foreshore land and soil under the waters of Fiji. Basically no such lands may be leased by the Director of Lands without the express consent of the Minister and the Minister may not consent unless he determines that no substantial infringement of public rights will take place. Provisions are made for notifying the public of the potential lease and anyone having objections may voice them to the Minister who must then take them into consideration before making his decision. If a favorable decision is reached, the lessee is vested in land free of all public rights to the extent necessary to carry out the purpose for which the foreshore was leased. Failure to use the land for the specified purpose may result in the Director of Lands declaring the lease void and repossessing the land.

Sections 21 and 22 do not apply to rivers though, nor to the erection of private wharves in a declared harbour under the provisions of the Harbour Act Cap. 184.

Sections 25 and 26 deal with licenses for the construction of tramlines, bridges, and tunnels on public land. All such construction requires the express approval of the Minister and he may require any special conditions necessary to insure that no substantial infringement of public rights takes place.

Generally leases to Crown lands issued by the Director of Lands may be for up to periods of 99 years with a renegotiation after 25 years. Leases may also contain conditions which require lessees to complete specified improvements within a given period. Doing Business in Fiji, Price Waterhouse, p. 6 (1983). In addition, Section 13 of the Act provides for what are called "protected leases." Basically such leases may not be sold, transferred or subleased without written consent of the Director of Lands.

Finally, as in all these statutes, there is a section which empowers the Minister to make regulations convenient and or necessary to administer this Act.

D. Native Lands

"The system of land tenure adds immeasurably to the difficulties of achieving logical growth. At present it is the Freehold and Crown Lands which are most likely to become available for

development, irrespective of their suitability for this purpose." (Greater Suva Urban Structure Plan, Section 10.1)

Over 83% of the land in Fiji is held under a system of customary tenure in which the matagali (a landowner's unit or clan) is the principal land-owning unit in Fijian society. The present laws which are directly pertinent to the use of these lands are Cap. 133--Native Lands Act and Cap. 134--Native Land Trust Act, of which Cap. 133 is administered by the Ministry of Fijian Affairs and Rural Development and Cap. 134 is administered by the Native Land Trust Board. Nayailalou, R.R., Fiji: Manipulating the System. Land Tenure in the Pacific, Ron Crocombe, (Ed.), Oxford University Press, Melbourne, pp. 206-220 (1971).

Under the Native Lands Act native lands are defined as all lands not Crown lands or subject to a Crown grant. The land is held by native Fijians according to native custom and tradition along with the regulations established by the Fijian Affairs Board. Cap. 133, Secs. 2 and 3.

Under the authority of this Act the Minister forms and appoints the members of the Native Land Commission. This Commission was empowered to ascertain what lands were native lands by survey and registering their boundaries in the Register of Native Lands. Cap. 133, Secs. 4 and 10.

Finally the Act provides in Section 22 that if the registered matagali becomes extinct--i.e.: all members of the village die leaving no survivors--the Crown takes the land. Cap. 133, Sec. 22. (Subject to sec. 19 of the Native Lands Trust Act, Cap. 134.)

All uses of native land by non-Fijians (including, obviously, foreign corporations) are governed by the Native Land Trust. Created by the Native Land Trust Act (Ch. 134), the Act establishes the Native Lands Trust Board (N.L.T.B.) to control all dealings with native lands. Essentially, the Board acts as trustee for native Fijians as both administrator and controller. Subject to Section 5 of the Act (which expressly prohibits any alienation of native land by Fijians on the Board except to the Crown) the N.L.T.B. has the power to grant leases or licenses on native land not in a declared native reserve. First, however, the Board must determine that the land is not being beneficially occupied by Fijians or required by Fijians for their use, maintenance, or support during the projected term of the lease. Cap. 134, Secs. 3, 4, 5, 8, 9.

The General Manager of the Board took pains to point out that the Board has its advantages for outside investors.

First, it becomes the agent of the Fijian landowners not only during lease negotiations but also during the life of the lease. It also approaches appropriate ministries and local governments for such as town planning permissions and/or subdivision and rezoning approvals. Once the lease is executed, it will not permit the Fijian owners to rescind, (provided the land is not in a native reserve and is decidedly beneficial to the native owners and the country) and the Board has and uses the legal power to overrule the Fijian owners where necessary. Presently, the Board is granting commercial and industrial leases for terms of 50 to 75 years, as well as various types of easements and licenses. (Interview with J.N. Kamikamica, General Manager, Native Land Trust Board, 12/7/83, Suva.)

The N.L.T.B. may set aside portions of native lands as native reserves. Once so designated (subject to the provisions of the Crown Acquisitions of Lands Act (Cap. 135), the Forest Act (Cap. 150), the Petroleum Act (Cap. 148), and the Mining Act (Cap. 146)), the Board may lease or license reserve land only with the owner's consent, and then only to Native Fijians, in accordance with regulations established by the Minister. Cap. 134, Secs. 15 and 16. The end result of these sections is to make it impossible for a non-Fijian foreign consortium to acquire more than a leasehold interest or a license in most land in Fiji (though there are apparently over 23,000 active such leases), and about 33-1/3% of this native land is classified as reserve in which such a consortium may have no interest at all (though it is theoretically possible--but only with the owner's consent--to "declassify" reserve land. Cap. 134, Sec. 17. This, according to the General Manager of the Board, is both rare and difficult. (Interview with J.N. Kamikamica, 12/7/83, Suva.)

Finally, Section 33 allows the Minister to formulate any regulations which are necessary or convenient for carrying out the effect of this Act. These regulations are fairly extensive and deal with the specifics of the forms of leases, types of leases, terms, and general conditions included in all leases. In an attempt to simplify matters, the N.L.T.B. has published a short set of procedures to follow when applying for leases of land outside native reserves.

III. Applicable Land Use Laws

A. Policy

Since 1949, Fiji has employed development plans as a means for stimulating economic growth and for providing a specific outline of governmental policies. The eighth development plan (D.P.8) covering the years 1981-85 was issued on January 1, 1981 and is now in effect.

Prior to discussing the policy set forth in this plan, however, it will be useful to have at least a rudimentary understanding of the existing administrative subdivisions in the island group. There seem to be no distinct separation of authority, but a multitude of tiers and overlapping boundaries. On the one hand there are the colonial distinctions of Divisions and Districts, while on the other there are the more traditional Fijian systems of Tikinas and Provinces. In addition there are town councils, rural health authorities, and governmental department units which may correspond to neither province nor the district, D.P.8, Vol. 2, Sec. 4.2.03. The Fijian government has attempted to overcome some of this confusion by espousing a plan for the establishment of a comprehensive system of regional planning. D.P.8, Section 1.4.03. While the plan itself has been divided into Divisions, it is the Province which has been proposed as the appropriate spatial unit for local level participation, co-ordination, and implementation of the plan. D.P.8, Vol. 2, Sec. 4.2.01.

At present, D.P.8 contains only broad policy statements that form the framework upon which the specifics of regional planning will be hung. The overall regional development strategy is to decentralize rural and industrial development through the application of specific programs and incentives. D.P.8, Vol. 1, Sections 3.4.01-.03. Strategies include Rural Growth Centers Network, Rural Infrastructure Development, Regional Industrial Policy, and Increased Decentralization. D.P.8, Vol. 2, Sec. 3.1.02.

Implementation of these policies is a complex matter and until more qualified personnel and the necessary infrastructure is available the greatest emphasis will be on central government initiative on a national level. During D.P.8 the onus appears to be on the Ministries to prepare and implement regional development proposals with the assistance of the Central Planning Office. D.P.8, Vol. 2, Secs. 4.3.01-.03. A greater allocation of this authority to Divisional Administrative bodies is planned through budgeting decentralization, concentrated infrastructure investment, new physical planning legislation, and specific incentive packages. D.P.8, Vol. 2, Secs. 4.3.04-.14.

B. Existing Legislation

The principal legislation which spells out the mechanics of land use regulation in Fiji are Cap. 139--The Town Planning Act; Cap. 140--The Subdivision of Land Act, and Cap. 142--The Land Development Act.

1. Town Planning

The Town Planning Act is probably the most important legislation in this area for our purposes. In theory, town planning schemes can be required for virtually any developable area held by other than native Fijians (which is easier to develop from a tenure perspective). Moreover, development must generally conform to such town planning schemes.

a. The Basic Statute

The Town Planning Act is administered by the Ministry of Urban Development, Housing, and Social Welfare. The Act provides for the appointment of a Director of Town and Country Planning (Director) by the Public Service Commission but who is responsible to the Minister. Cap. 139, Sec. 3. In addition the Minister is empowered to appoint a Town and Country Advisory Commission to advise him on all appeals from the decisions of the Director. Cap. 139, Sec. 4. Basically upon application by the Director, or for that matter a local authority (i.e.: a town council (Cap. 125), or for land outside a town, the local authority of a rural sanitary district (Cap. 111)) the Minister may declare any area a town planning area, extend an existing town planning area, or remove town planning area status from an area. Cap. 139, Sec. 6. Once an area has been declared a town planning area, it is up to the local authority to prepare and submit a scheme for development to the Director. Cap. 139, Sec. 18. The purpose of the scheme is to control development in the area by securing suitable provisions for "traffic, transportation, disposition of commercial, residential, and industrial areas, proper sanitary conditions, amenities and conveniences, parks, gardens, and making suitable provisions for the use of land for buildings or other purposes." Cap. 139, Sec. 16. Included in the Act are a series of schedules, one of which specifically details those matters which may be dealt with in a town planning scheme. Once the scheme has been provisionally approved by the Director it is made available to the public. Any affected owner or occupier may then inform the local authority of the objections to the scheme. The objections are submitted to the Director, who holds a hearing at which the objector may be present, and then makes a final determination. Cap. 139, Secs. 19-24. Appeal from the decision of the Director is directly to the Minister. Cap. 139, Sec. 8.

Once approved it is up to the local authority to ensure that all existing buildings or developments are made to conform with the scheme and all proposed development meets the requirements of the approved scheme. The power of the local authority even allows it to remove or demolish any building not brought into conformity with the scheme. Cap. 139, Sec. 27.

Provisions are included for the compensation of those individuals adversely or injuriously affected by the changes but numerous exceptions are listed for which no compensation is available. Cap. 139, Sec. 37.

The Act also provides a series of general sections which control development during the interim between an area being declared a town planning area and a scheme being developed. During this period no "development" (for definition see Sec. 2) may take place without the local authority's permission, who, in turn must have the consent of the Director. Cap. 139, Sec. 7.

b. Interim Development Controls

In October, 1979 the Director of Town and Country Planning adopted nine General Provisions for town planning schemes and areas. These provisions are to act as Interim Development Controls in those areas where there is no Approved Town Planning Scheme or in an area where the Approved Scheme is under suspension. Otherwise, the provisions are to act as broad policy guidelines upon which to base specific decisions. These General Provisions prevail over all local by-laws presently in force in any city or town (Sec. 16-4, Cap. 109), presumably they will be incorporated into all Approved Town Planning Schemes at the latter's next revision.

The General Provisions require that all Development be in accordance with any Scheme Plan of the Local Authority or the Schedules included in the General Provisions. (Provision 2.) The latter Schedules appear to be an expanded version of the Schedule included in the Town Planning Act--Cap. 139 (see Appendix II of original report). These Schedules not only set out the type of zones (i.e.: residential, commercial, industrial, etc.) but also include specific requirements in terms of Site Dimensions (Sch. B); Hotels, Tourist Apartments, Private Hotels, Boarding Houses, and Guest Houses (Sch. C); Advertising (Sch. D); Parking (Sch. E); and Subdivisions (Sch. H). However, Provision 2 also makes it clear that no Development is allowed without written permission from the Land Authority first. "Development" for the sake of these provisions is broadly defined as any material alteration to or change in use of any structure, building, road or land (Provision 8).

Provision 3 establishes the Director as the final arbiter in terms of interpreting the meaning of these provisions. However, Subsection 2 of Prov. 3 makes it clear that resolutions of specific conflicts between a Local Authority and applicant for Development by the Director are to be of no precedential value. The Local Authority is still free to reach a contrary decision in a parallel situation. Again, however, appeal to the Director for final resolution remains open.

Provision 3 also empowers the Director to issue policy statements for "Conditional Development" and allows the Director to delegate sole responsibility for such Development to the Local Authority. "Conditional Development" means development which is not permitted as of right in a given zone but may be approved by the Director subject to the conditions established in his policy statements. (See Schedule A, Provision 9.)

The Local Authority, with the Director's approval, may also relax the requirements of the General Provisions in specific cases, provided that the consent does not conflict with the overall principles of the scheme. (Provision 6.) The Local Authority may afford objectors a special meeting at which to be heard. (Provision 7.) This provision also empowers the Local Authority and Director to dispense with public notification if their intention to relax the General Provision requirements would cause no inconvenience to the owners of the affected land. However, they are required to seek comments from owners likely to be affected. (Provision 7.)

c. The Suva Town Plan: A Town Planning Scheme

The plan for Suva itself has been duly passed by the Suva City Council and approved by the Director of Town Planning, as noted above, all in accordance with the national Town Planning Laws (Ch. 139, Section 18, Laws of Fiji). Therefore, as to Suva at least, the local authority has general authority to approve developments in accordance with the approved scheme. Indeed, the Town Planning Act gives the local authority power to tear down structures not in conformity with the approved town planning scheme. (Chap. 139, Section 21.) Compensation is often payable, however, and the local authority may, if it makes timely claim, "recover" up to three-fourths of the increase in land value resulting from the town planning scheme (Section 31).

However, the Suva town planning scheme does not cover the port area and other areas of so-called "greater Suva" to the south and west, where it is expected that future coastal commercial and industrial development will occur (although there do not appear to be any parcels presently designated for industrial development large enough to accommodate a manganese nodule processing plant). Moreover, it is not likely that Suva will ever expand its local town planning authority into those regions, an attempt to do so having been only recently turned back by the central government planning authorities (interviews with Usman Ali and Nair). And while there is a 1975 Greater Suva Structure Plan (1975) for these developing areas, the individual municipalities therein do not have approved town planning schemes--or, apparently, any local land use controls--and so the central government's Director of Town

Planning approves all development needing such approval under the national town planning statute (interviews with Sharan and Gautem).

d. The Greater Suva Urban Structure Plan

While it is not a document which is binding upon the Ministry of Town Planning, the Greater Suva Urban Structure Plan does give some indication of how the Director of Town and Country Planning visualizes the commercial and industrial development of the Greater Suva area, and particularly those areas suitable by reason of port proximity and size for a manganese nodule processing plant, though it is worth noting at the outset that much of the developable land is said to be largely in the hands of the Native Land Trust, discussed elsewhere. At least when the plan was drawn up in 1975 it concluded that more than enough land was designated for industrial development (Section 1.3) for immediate needs, but more than the roughly 700 acres so available would be needed: 250 acres by 1986 and an additional 150 acres by 1996 (Section 7.2). These acreages do not include certain port/dock developments, but this is not particularly relevant to this study since the acreage available there does not approach the 250 acres minimally presumed to be necessary for a manganese nodule processing plant. It is also worth noting that "The industries permitted on such areas will be strictly controlled to prevent environmental pollution including noise and nuisance to adjoining uses." (At 9.4)

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A review of the District Plan summaries (district plans are to be detailed amplifications of the structure plan prepared by local authorities within the Structure Plan's parameters) indicate that while the majority of the half-dozen local governments develop such plans, most have designated land for industrial purposes. (Structure Plan, Chapter 11.) However, no site is large enough for a manganese nodule processing plant, and nothing reported in the summaries indicates any intention to undertake any reclassification of land to industrial designations on a sufficiently massive scale to accommodate such a plant.

In sum, it would appear from the plans and planning documents we have collected that the town planning laws and related plans do not presently show sufficient industrially-classified land in the Suva region for such a plant. This does not, of course, mean that the town planning laws are a barrier to such development. As noted above, the Town

Planning Act specifically provides for the central government to control most development in all town planning areas (many are set out in the act, and are virtually the only areas in which development may occur) unless--as in the case of Suva--the Director of Town Planning and his Minister have approved a local town planning scheme (Section 44). These developments--and in particular the large industrial variety contemplated here--are governed by Town Planning (Interim Development) Regulations (Cap. 139, Ed. 1978). The development of a processing plant would be considered a "Third Schedule" development, under Class V: "Use for any of the following processes: (i) smelting, calcining, or other reduction of ores or minerals" (Third Schedule, Cap. 139, Ed. 1978 Subsidiary Legislation). An outline application for such development is made to the local authority and approved by the Director of Town and Country Planning.

As before noted, it is necessary for a developer to have the permission of the local authority before developing any land (Section 7) which must then be approved by the Director of Town and Country Planning.

2. The Subdivision of Land Act

The Subdivision of Land Act, also controlled by the Ministry of Urban Development, Housing, and Social Welfare directly affects the use of land in Fiji. Basically the Act may apply to any land the Minister sees fit to define and describe except "a) Crown land which is not the subject of a registered base; b) land included within the boundaries of any city or town to which the Local Government Act (Cap. 125) does not apply - in this case, Suva and Lantoka which have their own subdivision bylaws; and c) land included in any native reserve constituted under the Native Land Trust Act (Cap. 134)" Sec. 2. The Act does not apply simply to residential land but includes the full range of land uses (i.e.: agricultural, residential, commercial, industrial, etc.). Section 5(3)(d) requires that an application for a proposed subdivision includes the purpose for which the lots shall be used. Section 8(3) gives the Director of Town and Country Planning (Cap. 139) the discretion to prohibit an offensive trade, business or manufacturing concern from being established on the lots if it will, in his opinion, be deleterious to the health, amenity, or convenience of the neighborhood. Finally Regulation 5(f), promulgated under the Act, contains provisions for agricultural subdivision, while Regulation 6 contains the requirements for a proposed subdivision of land for commercial purposes.

The Act is administered by the Director of Town and Country Planning, whose approval is required before any land may be subdivided unless it is at least three miles from the boundary of any town and no lot is less than five acres in area.

Cap. 140, Sec. 4. The local authorities play only an advisory role under the Act, with complete discretion vested in the Director, who may refuse an application to subdivide for any reason concerning the health, amenity or convenience of the neighborhood or set any conditions he sees fit for approval. Cap. 140, Secs. 8-10.

Appeals from the decisions of the Director are made directly to the Minister and his decision is final. Cap. 140, Sec. 14. Any building constructed contrary to those conditions set by the Director may be ordered destroyed by the local authority. Cap. 140, Sec. 16.

3. Land Development Act

Land development outside town planning areas is regulated in part under the Land Development Act--Cap. 142--(Ministry of Agriculture and Fisheries) which also establishes a Land Development Authority. The purpose of the Authority is to initiate, approve, and carry out "land development, improvement, and settlement schemes and schemes for the processing and marketing of produce." Cap. 142, Sec. 3. These land development schemes are not limited to those areas designated as Town Planning Areas (TPA) but when they do fall within these TPA's, they must conform to the approved town planning scheme. The power of the Authority outside of the TPA's is broadly stated as being able to do anything and to enter into any transaction . . . "which in its opinion is calculated to facilitate the proper discharge of its functions or is incidental to or conducive thereto." Cap. 142, Sec. 3.

The Authority's means of implementing this broad purpose is the creation of corporations or Local Development Boards which are vested with the Authority's powers to make loans, approve schemes, and in general, promote orderly development. Cap. 142, Secs. 23, 26, 27. Some examples are the IKA Corporation established to aid in the exploitation of marine resources on a commercial basis and the Uluisaivou Corporation to aid in agriculture, timber, and land development in the old Tikina of Saivou and Nalawa in the Province of RA. Cap. 142, Sec. 23 of the Land Development Orders.

4. Industrial Estates

Immediately after independence the Fijian National Government began to formulate a national industrial programme known as the rural and urban industrial support services programme. Obtaining funds from the Fiji Government and the United Nations Industrial Development Organization the plan was implemented by the Ministry of Commerce near the end of the 6th Development Plan period (1971-75). Under the program a series of

rural service centers and industrial areas were established. The services centers provided mechanical assistance and training, while the industrial areas were created as an incentive for the establishment of small scale industries. Factory buildings were constructed in the industrial areas by the government and then rented at a nominal rate or sold on favorable terms. Fiji the First Decade 1970-1980, Ministry of Information, pp. 65-66.

The Ministry established industrial areas at Vatuwaqu and Kalabu, near Suva, Ba, Valukoula, Labasa, and Savu Savu. Most of the industries in these areas are small scale including such activities as the manufacture of furniture, corrugated roofing iron, roofing nails, confectionaries, and plastic products. Id. at 66. However, many of these sites have been plagued with problems such as flooding and electricity blackouts since their beginning. Fiji, Ministry of Information, Vol. 5, Nos. 1 and 2, Jan.-April, 1982.

The Fijian Government's basic policy of establishing industrial areas was reiterated in its 8th Development Plan. Citing the lack of cheap industrial land and the desire to promote regional dispersal of industries the government plans on continuing to development industrial sites such as at Walu Bay and Vakamasisuasua Stage I. D.P.8, Vol. 1, Sec. 9.7.21. Industries using imported raw materials are going to be encouraged to locate away from the Suva-Nausori urban corridor, to such other areas as Nani, Sigatoka, Ba, Labasa, and Savu Savu. SP8, Vol. 1, Sec. 9.7.19.

Yet another incentive to investment in Fiji is the development of Free Trade Zones. Establishment of a company within these areas will allow the owners to import materials and machinery into the country duty free while all goods manufactured and exported from these zones will have no levies placed on them. Industrial land in such areas as Ba, Nadi, Labasa, and Savu Savu will be used for such zones in addition to the main location in Suva. Fiji: The First Decade 1970-1980 at p. 65.

Although these industrial areas have been established without envisioning the placement of a large heavy industrial factory, such as a manganese nodule processing plant, they represent a concrete example of the country's desire to promote foreign industry.

5. Miscellaneous

Other statutes which fall indirectly under the heading of land use laws are the Mining Act--Cap. 146, the Quarries Act--Cap. 147, the Petroleum (Exploration and Exploitation) Act--Cap. 148, the Continental Shelf Act--Cap. 149, the Forest Act--Cap. 150, and the Fiji Pine Commission Act--Cap.

151. These are of limited applicability to such as a nodule processing plant, and parts of these acts are discussed below under other headings.

IV. Environmental Laws

A. Policy

There are several indications of a strong, developing environmental policy in Fiji's Eighth Development Plan:

In D.P.7 there were a number of objectives to protect and conserve important features of Fiji's unique environment. The overall aim was to exploit Fiji's natural resources wisely, in a manner consistent with the maintenance of a healthy environment. Specifically, Government intended to promote public access to beaches, to develop national and regional parks for recreation and study, to restrict excessive noise pollution, and to ensure that major resource development projects were permitted only in the context of strict environmental safeguards.
Section 12.5.05

An interministerial Environmental Management Committee has been instituted to help administer the Government's environmental policies and act as the main forum in which research priorities and coordination can be discussed. To provide the administrative framework to implement these policies an Environmental Unit is to be established within the Directorate of Town and Country Planning.

One of the main policy programmes established in this chapter is Programme 3: The Environment: Management, Recreation and Conservation. The main objective of the program will be to provide outdoor recreational facilities and to conserve natural areas of beauty or scientific interest by establishing a system of regional and national parks. Proposed legislation (i.e.: The National Parks and Reserves Act) is to be passed during D.P.8 with the National Trust having the main responsibility of administering the law new. D.P.8, Vol. 1, Secs. 12.5.23 and .27.

B. Environmental Impact Assessment (EIA) and Environmental Impact Statement

As indicated in the materials discussed above, Fiji has no formal EIA/EIS policy, though it is reportedly developing such a policy through national legislation (Interviews with Nair, Singh, Matas, Duff and Rahiman).

The objectives and programs of the Mineral Sector, 8th Development Plan provides the basic framework for the Fijian Government's policy toward environmental assessment. Specifically stated as a Mineral Sector Objective during D.P.8 is "to ensure that mining activities have minimum adverse impact on the environment." D.P.8, Vol. 1, Sec. 9.5.15. Program 4, Project 2: Evaluation of Environmental Impact specifically provides for the Government to require an environmental impact statement (E.I.S.) from any company who plans on undertaking a mineral or oil development project. The Mineral Resources Department is made responsible for implementing this project. D.P.8, Vol. 1, Sec. 9.5.31.

The existing laws through which this policy is most likely to be enforced are the Mining Act--Cap. 146 and the Petroleum (Exploration and Exploitation) Act--Cap. 148. While neither of these laws specifically provide for an E.I.S. there are provisions broadly worded enough to incorporate the requirement.

Although the requirements under these two laws are limited to mining and petroleum exploitation, they are a strong indicator of the Government's expanding awareness of the environmental consequences of large projects. Further indications of this are that proposed changes to the Town Planning Act include making environmental analysis an integral part of the planning process along with requiring environmental impact statements prior to particular development proposals. South Pacific Regional Environmental Programme, Country Report No. 4--Fiji, p. 5 (1980).

Therefore, although some environmental analysis makes its way into the mineral extraction and mining laws, which may serve as an example of how the process works informally, those in charge of the Mining and Minerals Department stress that their statutory authority does not appear to cover a non-mining related processing plant such as the kind upon which this study is predicated. On the other hand they--and other officials--stress the near-certainty that national government permits and other approvals would not be forthcoming without such an EIA/EIS process (often written up by the Marine Resources Department of the University of the South Pacific). By the same token, all agreed that the EIS would be "information only" in nature and not binding on any governmental agency. Nevertheless, it is clear that some notion of how environmental problems associated with such a plant were going to be mitigated if not solved would be necessary in order to move such a project along. (Interviews with Dutt, Rahiman, Matos 12/5/83, (also Raj) and Singh on 12/7/83, all in Suva.)

C. Water Quality

There are several pieces of legislation in Fiji which directly or indirectly deal with the quality of fresh water: Cap. 111--The Public Health Act; The Water Supply Act (although included in the index to the Laws of Fiji, Ed. 1978, this act has been omitted for some reason); The Land Conservation and Improvement Act (also omitted); and Cap. 134--Native Land Trust Act.

The Public Health Act, administered by the Ministry of Health, establishes a Central Board of Health whose main purpose is to propose and enforce regulations concerning the public health. Cap. 111, Sec. 3. In addition, the Act provides for local authorities--town councils or other bodies appointed by the Minister--to assist the Board in enforcing the regulations. Cap. 111, Sec. 10. Basically, the Act classifies it as a nuisance for anyone to pollute or permit noxious matter or water to flow into any harbour, river, port, ditch, or foreshore area. Cap. 111, Sec. 56.

"The Water Supply Ordinance 1955 provides for the declaration of water catchment areas for the purposes of water supply and makes it an offense for anybody to do anything which may pollute a waterworks of water catchment area." South Pacific Regional Environmental Programme: An Overview of Environmental Protection Legislations in the South Pacific Countries, p. 5 (1981).

The Land Conservation and Improvement Act established a Land Conservation Board comprised of the directors of Agriculture, Public Works and Lands, and the Conservation of Forests. The general purposes of this Board were to supervise land and water resources, recommend legislation necessary to protect these resources, and to issue Conservation Orders. The content of the latter orders included the power to prohibit, regulate and control the clearing of land, grazing and watering of livestock, method of cultivation, and the despoilation of land. Id. at 17.

The Native Land Trust Act has already been discussed in some detail but it is worth noting that under the Native Land (Leases and Licenses) Regulations established under that Act the lessee is prohibited from clearing or burning of brush or cultivating land within a distance of 24 feet from the bank of any stream or river. Cap. 134, Sec. 33, No. 25.

D. Marine Environment

As with water quality there are no statutes which deal only with marine environmental problems. Instead, provisions in

numerous Acts deal indirectly with the problem. Some of the most pertinent for purposes of this study: Cap. 158a--Marine Species Act; Cap. 149--Continental Shelf Act; The Harbour Act of 1974 (omitted from 78 ed. Laws of Fiji); Cap. 181--The Port Authority of Fiji Act. These have potential impact on a nodules processing plant especially in harbor areas.

The Marine Spaces Act was passed to demark the limits of Fijian waters, but it also contains provision for the Minister responsible for Foreign Affairs to conserve and manage these marine spaces in such a manner so as to assure that irreversible long term adverse effects on the marine environment are avoided. Cap. 158A, Sec. 2-11. The Act is administered by the Office of the Prime Minister.

The Continental Shelf Act in many senses replicates the Marine Spaces Act, and yet is administered by the Ministry of Lands and Mineral Resources. The purpose of the Act was to provide for the protection, exploration, and exploitation of the natural resources on the continental shelf. Of particular interest to this survey, Section 9 establishes liability for the negligence of an owner of any pipeline or exploration project which discharges oil into the sea.

The Harbour Act (1974) also provides for heavy penalties for pollution of harbour and coastal waters. S.P.R.E.C., Topic Review 13, p. 20 (1981). (Much of this Act appears to be superceded by the Port Authority of Fiji Act, discussed below. Cap.181, Section 64.)

V. Port Authority and Foreshore Controls

The Port Authority of Fiji is administered by the Ministry of Tourism, Transport, and Civil Aviation and was enacted for the main purpose of establishing the Port Authority of Fiji. Headed by a Director-General appointed by the Minister, the function of this Authority is to control and regulate all aspects of the harbours, wharves, and ports of Fiji. Cap. 181, Sec. 10. The Authority, with the consent of the Minister, has been empowered to make any regulations necessary to perform its duties. More specifically it has a mandate to keep the basins, works, and waters of all ports clean by preventing oil, rubbish, or other trash from being thrown in the water. Cap. 181, Sec. 63.

As with most Port Authorities, the one for Fiji has responsibility to control the loading or discharging of goods as well as the regulation of shipping in the ports themselves (two-Lautoka and Levuka--besides Suva). This will clearly have an impact on the bringing in of manganese nodules for processing, and the export of the extracted metals, also by ship. The Port

Authority also has the power ". . . to control the erection and use of wharves, docks and any other works. . . within the port." (Id. at Section 11(1)(j)) and to acquire, either voluntarily or by compulsory purchase, any ". . . undertaking, affording or intending to afford facilities for the loading and discharging or warehousing of goods in a port . . ." (Id. at Section 11(1)(h)) and re compulsory purchase, Section 2.) This gives the Director of the Port Authority, and the Authority itself, considerable site location and building control over a portside facility such as a manganese nodule processing plant, especially as the appropriate central government minister may, after consultation with the Authority, ". . . declare any place . . . to be a port within the meaning of this Act." (Id. Section 3(1)(a).)

A. Air Quality

Except for the Traffic Act--Cap. 176--Fiji seems bereft of any statute which directly addresses the problem of air pollution. While this seems reasonable given the few heavy industries in the country, at least one official firmly believes smog would engulf Fiji's urban areas but for the constant winds which blow over the islands.

VI. General Conservation

The most important legislation in this area is the National Trust of Fiji--Cap. 265, the Land Conservation and Improvement Act, and the Mining Act. Other statutes which relate to this area are the Forests Act--Cap. 150 and the Birds and Games Protection Act--Cap. 170.

The National Trust for Fiji Act, administered by the Ministry of Works and Communications, establishes a trust known as the National Trust of Fiji with a governing body of 10 members appointed by the Minister called the Council of the Trust, Cap. 265, Secs. 4-5. The function of the trust, in part, is "to promote the permanent preservation for the benefit of the nation of lands (including reefs) . . . to protect animal and plant life; and to provide for the access to and enjoyment by the public of such lands . . ." Cap. 265, Sec. 3. The Trust has been involved in several projects including the establishment of a Wildlife Island Reserve for the protection of the Habitat of the Fiji Crested Iguana. (For more information concerning particular projects of the Trust see: Knox, Margaret, The Green Book for Fiji--a teacher's handbook on the conservation of nature in Fiji (1978) and Fiji, The First Decade, 1970-1980, Ministry of Information (1980). The broad guidelines for the Land Conservation and Improvement Act have already been discussed (see discussion under Water Quality).

While the Mining Act contains several sections which may be of particular relevance to the conservation of land, it appears that it would not have jurisdiction over separate, free-standing processing plants as contemplated by this study.

The Forest Act, administered by the Ministry of Forests, is specifically directed to the preservation of Fiji's forest lands. The Act provides for the Office of Conservator of Forests, which is responsible for the supervision of forest reserves and general enforcement of this Act. The Conservator, who is directly responsible to the Minister, is advised by the Forestry Board who in turn is advised by local Forestry Committees. Cap. 150, Secs. 3-5. The Minister is empowered by the Act to declare any unalienated Crown land or land leased to the Crown a reserved forest, a nature reserve, or a silvicultural area. With the consent of the Native Land Trust Board the Minister may also declare any native land to be a protected forest. The Minister even has the power to forcefully acquire land for a reserved forest under the provisions of the Crown Acquisition of Lands Act. Cap. 150, Secs. 6, 7, 8 and 11.

The Birds and Games Protection Act, administered by the Ministry of Agriculture and Fisheries, basically provides for the appointment of game rangers, the establishment of game reserves by the Minister, and the protection of certain birds, nests, and eggs. Cap. 170, Secs. 3, 10, 11. The Act makes it an offense to harm, in any way, the protected species and requires that licenses be obtained before hunting of any game is allowed. Cap. 170, Secs. 3, 6, 14.

VII. Conclusion

Based on the availability of fresh water, electricity, transportation facilities, and especially wharfage and port facilities, a likely spot in Fiji for locating the processing plant would be in the Suva area. However, based upon availability of suitably large sites, it may be that other sites are preferable, even though no other port has the infrastructure available in this location.

The first step involved in obtaining the necessary approvals and permits would be in contacting the Ministry of Commerce and Industry and submitting a Project Appraisal Information Form to the Business and Industrial Development Committee (B.I.D.C.). Approval by the B.I.D.C. will mean that all relevant Ministers have approved the project under the laws herein surveyed. A brief summary of the application of those laws to the different segments of the overall processing plant development follows.

For the sake of simplicity the overall manganese nodule processing plant may be divided into four main segments: 1) port facilities; 2) lease, purchase, or easements necessary for transport of nodules from the port facilities to the processing plant; 3) the processing plant; and 4) land or sea disposal sites necessary for the waste tailings. The laws surveyed will be applied to each segment in turn, keeping in mind that there may be considerable overlap in the application of specific laws.

A. Port Facilities

To purchase or lease land for the construction of a port facility, the applicable law will depend upon what tenure system the land is held under. If the land is freehold the Land Sales Act will apply and approval of the purchase will have to be obtained from the Ministry of Finance. If the land is Crown Land the latter Act plus the Crown Lands Act will apply. Under the Crown Lands Act permission to purchase such land must be obtained from the Minister of Land and Mineral Resources while the lease of this land may be approved by the Director of Lands with the consent of the Minister (Note the application of Cap. 132, Secs. 21, 22--See discussion of Crown Lands). If it is Native Land it may not be purchased, as any alienation of native land is prohibited by the Native Lands Trust Act. Leasing of the land is permitted though, so long as it is not in a native reserve (though the Board may seek "dereservation" if it can be "conclusively demonstrated" that the proposed use will be beneficial both to the native owners and the country) and the approval of the Native Land Trust Board (established under the Native Land Trust Act) is obtained.

Since the development involves a port facility and industrial activity, several other laws are also applicable to this stage. First, the use of the land will have to comply with the approved scheme for the area designated under the Town Planning Act. In the case of Suva, the City Council, established under the Local Government Act, would be the enforcing agency. However, as little land is available near the water, another local government will probably control development, and as none but Suva has an approved scheme, the central government's Director of Town Planning will probably control. Secondly, the construction of private wharves is controlled by the Port Authority of Fiji established under the Port Authority of Fiji Act. Approval of the Authority will be required before any construction could begin. (The Harbours Act may also be applicable but seems to have been superseded by the Port Authority of Fiji Act.)

The environmental aspects of the port facility fall under several different Acts. Under the proposed revision of the Town Planning Act and the broad wording of the Mining Act (if applicable) an environmental impact statement may be required before the Development can proceed. On the other hand, informal environmental impact review is almost certain via interministerial committee. Once the port facility is completed the Public Health Act, the Mining Act, the Harbour Act, and the Port Authority of Fiji Act all contain provisions regulating the pollution of harbour waters.

B. Lease, Purchase, Easements Necessary for Transport of Nodules

The lease and purchase of land under the various forms of tenure have already been discussed in the preceding section, but four laws in particular are applicable to this segment of the development--The Property Law Act, the Land Transfer Act, the Crown Lands Act, and the Mining Act.

The Property Law and Land Transfer Acts embody the English common law concerning easements and so are applicable. Under the Crown Lands Act the approval of the Minister of Lands and Mineral Resources is required before a license will be granted for the construction of tramlines, bridges or tunnels on public land. Under Mining Regulations special site rights for the construction of tramways, pipelines, and conveyor belts are granted at the discretion of the Director of Mines, with the approval of the Minister as long as they fall within the safety standards set out by the Lands and Mines Department and the Harbour Department.

C. Processing Plant

Most of the applicable property, land use, and environmental laws have already been discussed in the context of the two preceding categories but of particular interest to this section are the special site rights under the Mining Act and the establishment of Industrial Estates and Free Trade Zones. Once again special site rights are granted as above and incorporate treatment of ore, stockpiling of products, and the erection of processing plants. Locating the plant in an already established industrial estate or free trade zone obviously has its benefits in terms of existing infrastructure, compliance with the town planning scheme, and tax savings. The present size of such estates does not allow for this at the moment, but, as already indicated, the mere existence of these zones exemplifies the Government's desire for further industrialization.

D. Tailings Disposal

Disposal of tailings on land is unlikely in Fiji merely because of the fact that it is an island and land is already in short demand, unless the tailings are useable as, say, for road surfacing, a possibility under ore processing alternative. If such a course was chosen, however, the Mining Act and Land Conservation and Improvement Act would clearly apply.

Under the Mining Act (if applicable) the disposal of tailings either into a watercourse or in general is regulated by the Director of Mines who issues the permit at his discretion. In addition, the Director is empowered to control the clearing of land and its restoration once the surface of the land has been disturbed by mining activity. The Land Conservation and Improvement Act (we have no copy at present) provides general guidelines and creates the Land Conservation Board. As indicated this Board has been authorized to supervise land and water resources and prevent despoilation of land. We might therefore presume that the Board's approval would also be necessary before land based disposal of tailings would be permitted (I emphasize that this is an assumption!).

Ocean disposal of the tailings is far more likely. Potentially the Mining Act would apply but in addition, the Marine Spaces Act and the Continental Shelf Act have relevance also. Under the Marine Spaces Act the Prime Minister is given the mandate to protect marine resources from long term adverse effects while under the Continental Shelf Act the Minister of Lands and Mineral Resources is empowered to protect the natural resources of the continental shelf.

The major potential stumbling block for locating a processing plant would seem to be the environmental consequences of the plant. However, since most available information suggests that the overall adverse impact is small, combined with Fiji's desire for export oriented industries would likely overcome this obstacle. Nevertheless, the Fijian Government has recently become more and more concerned with environmental impacts and effects of development. There seems to be a definite trend towards updating their environmental policy. Finally, Ministerial jurisdiction over particular matters has some overlap. Whether approval from all relevant Ministries is necessary or just one will suffice is of keen importance in understanding the impact of these laws. The broad terminology used in the statutes leaves this question unanswered. However, preliminary inquiries in Suva indicate there is no vehicle like, say, the Franchise Agreement parliamentary "special bill" in Queensland, Australia, by which all approvals can be set at once and/or all local and state land law proceedings cut short.

P H I L I P P I N E S

PHILIPPINES

I. Introduction

A. Geography and Climate

The Philippines lies 580 miles (966 km) southeast of continental Asia and north of the equator, between latitudes 4 degrees 23' north and 21 degrees 25' north and longitude 116 degrees 30' east. It is bordered by the China Sea on the west and north, the Pacific Ocean on the east, and the Celebes Sea and Coastal Waters of Borneo on the south.

The Philippines consists of 7,100 islands (12 of which make up 96 percent of the total land area) that stretch a thousand miles northward from Borneo to Taiwan. It has a total land area of 115,000 square miles (297,850 km), and is divided into three main regions: Luzon, Visayas, and Mindanao. The Luzon region is the northernmost region and consists mainly of Luzon Island. the Mindanao region is the southernmost and consists mainly of the island of Mindanao. The Visayas region makes up the central region and consists mainly of the islands of Samar, Negros, Palawan, Panay, Leyte, Cebu, Bohol, and Masbate.

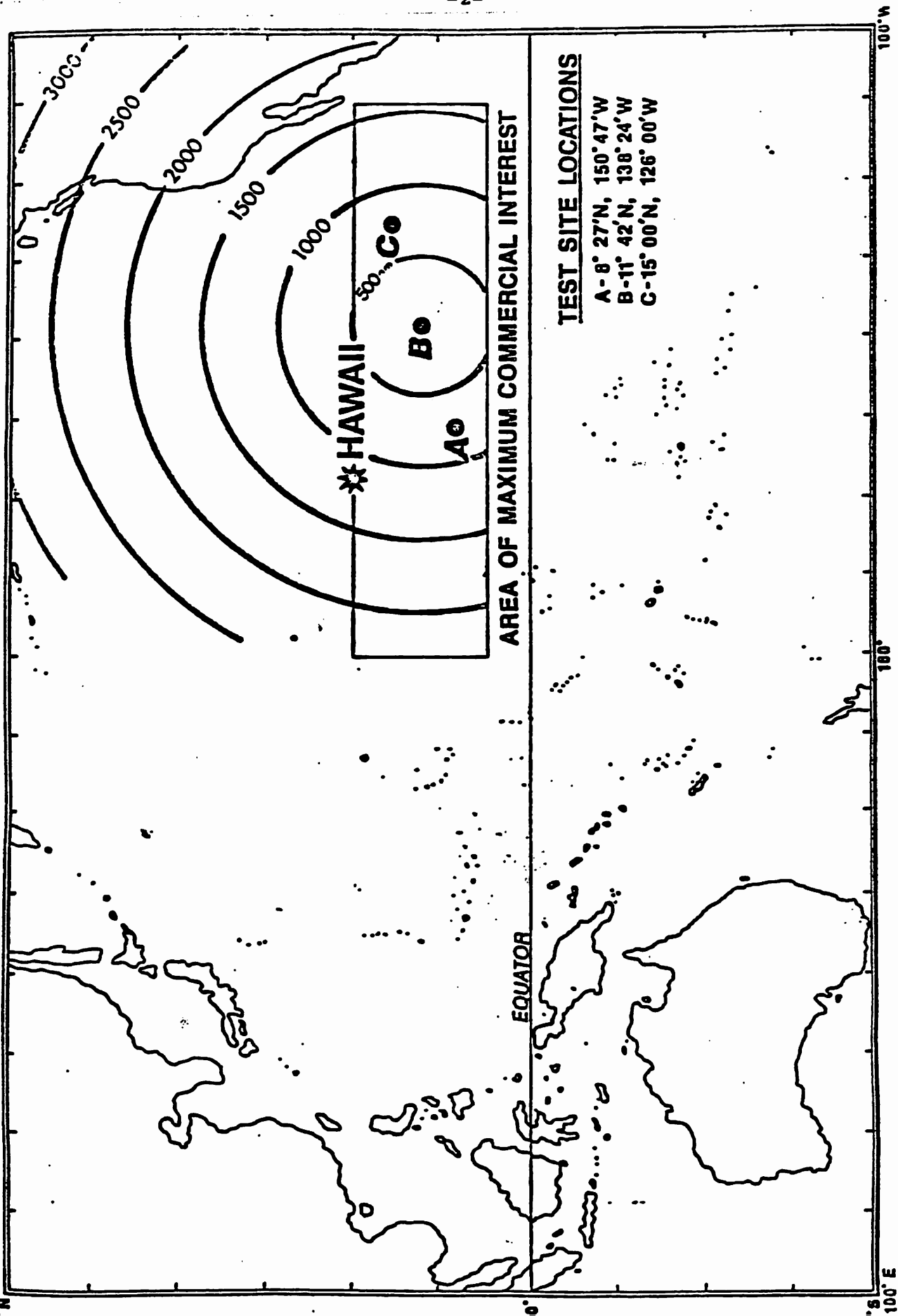
The Philippine coastline is 10,850 miles (17,460 km) long, which makes it about twice the length of the coastline of the United States. There are 61 natural harbors, with Manila being one of the finest natural harbors in the world.

The land in the Philippines is 30 percent arable, 41 percent forested and mountainous, and 29 percent swampland. It contains mineral deposits, particularly copper, which is mined in abundance. The location of chief mineral regions is shown on the following page.

The climate of the Philippines is tropical, with an average temperature around 81 degrees fahrenheit (27 degrees centigrade). The northern half of the country has rainy monsoon season from July to October, but the southern half has more stable weather, and is not as affected by monsoons. (Doing Business in the Philippines. Price Waterhouse, 1981, pp. 1-2).

B. Labor Force

The labor force in the Philippines is one that could easily supply the labor demands of a manganese nodule processing plant in the islands.



The population of the Philippines today is approximately 48 million: 43 percent are under 15 years of age, 54 percent are 16 to 64 years of age, and 3 percent are 65 and over. As in most third world countries, the young migrate to the urban areas in search of better job opportunities than are available in the rural areas. The Philippines is considered to be one of the most highly educated countries in Southeast Asia, with a literacy rate of 85 percent. English and Filipino are the major languages of instruction in the Philippine educational system, making the Philippines the third largest English speaking country in the world. Laws and regulations are published predominantly in English. (Id., pp. 3-4.)

The high level of education combined with an economy that lacks the capital to develop itself results in an oversupply of skilled workers. Inexpensive, well-trained labor is a resource on which an industry interested in locating in the Philippines can tap.

C. Government

The government of the Philippines is in a stage of transition. While martial law was lifted by President Marcos on January 17, 1981, rumors concerning the President's health and continued unrest over the assassination of the popular opposition leader Benigno Aquino, together with guerrilla activity in the less populated parts of the country, make the future politics of the country difficult to predict. (Doing Business in the Philippines. Price Waterhouse, 1981, p. 3). The interim government consisted of the President, who also served as Prime Minister, and an interim legislative body. The government, as set out in the 1973 Constitution, became fully activated with the election of the regular Batasan Pambansa in May, 1984. (1973 Constitution, Art. VIII, Sec. 5-1.) The main governmental entities are now the President, the legislature (Batasang Pambansa), Prime Minister, Judiciary, and local governments.

The President is the head of state and the chief executive. (Id., Art. VII, Sec. 1.) He is elected by direct vote of the people for a six-year term. (Id., Sec. 3.) He has control of the ministries (Id. Sec. 8), and is commander-in-chief of the armed forces, with the power to declare martial law whenever necessary. (Id., Sec. 9.) As chief executive, he also has the power to veto laws passed by the Batasang Pambansa. Moreover, under the notorious Amendment No. 6 (1976) to the Philippine Constitution, the president has "standby" legislative power to issue decrees on virtually "any matter for any reason that, in his judgment, requires immediate action" if the legislature fails to "act adequately." This the current President has done many times.

The Batasang Pambansa is the legislative body of the Philippine government. Its members are elected for six-year terms. (Id. Art. VIII, Sec. 3, 5-1.) Once it passes a bill, the bill goes to the President for signature. If the President vetoes it, the Batasang Pambansa can override the veto by a two-thirds vote. (Id., Sec. 20-1.) The Prime Minister may advise the President to dissolve the Batasang Pambansa anytime except 18 months before and 18 months after regular elections. (Id., Sec. 2.)

This gives the President considerable power over the legislature, as the Prime Minister is nominated by the President from among the members of the Batasang Pambansa. (Id., Art. IX, Sec. 1.) Although the nomination must then be approved by a majority of the Batasang Pambansa, the Prime Minister has supervision of all ministries. (Id., Sec. 10.)

Local governments are divided into provincial, city, municipal, and barrio governments. These entities are governed by The Proposed Local Government Code of 1975, which among other powers, gives these governmental bodies zoning power. They are also given power to tax under the 1973 Constitution. (Id., Art. XI, Sec. 5.)

D. Ports

As an island country, the Philippines has numerous ports suitable for the unloading of manganese nodules. Manganese nodule beds at Domes site B mine site are 5,800 nautical miles from Manila. (Raymond W. Jenkins. A Characterization of the Potential Manganese Nodule Processing Industry for Siting and Infrastructure Studies, p. 9.)

The Philippine Ports Authority (hereafter PPA) is the government agency in charge of the maintenance, operation and development of ports and port-related services in the Philippines. (PD 857, Sec. 6.) Most ports are developed by the government, but private port development is also permitted. (PPA Memorandum Circular No. 36.)

Private port development is welcomed under the following circumstances:

- 1.1 Where existing port infrastructure, technology and equipment, whether provided by government or by the private sector are not sufficient or capable of meeting the current or projected demands;
- 1.2 Where government finances are not sufficient nor available to meet the expenses in the provision of such additional port infrastructure, technology and equipment required; and

- 1.3 Where such port infrastructure, technology and equipment conforms to the government port development plans. (Id., Sec. 1.1-1.3.)

If the above requirements are met, an "Application for Permit to Construct" is filed, and if approved, a permit is granted by the PPA. (PD 857, Sec. 6.) The PPA may assist the port developer in acquiring land for the development of a port through its power of eminent domain. PD 857 provides that the "PPA has power...to exercise the right of eminent domain, by expropriating the land or areas surrounding the port or harbor, which in the opinion of the Authority, are vital or necessary for the total development of the Port District." (Id., emphasis added.) Thus, acquiring land for the development of a private port could be expedited if the project is approved by the PPA.

Once a private port is constructed, it is "permitted to operate and exist as such for as long as the corresponding Bureau of Lands foreshore lease agreement or any other similar government contract remain valid and in full force and effect. Thereafter, the port facility and any improvements on the lease area shall be vested in the government." (PPA Memorandum Circular No. 36, Sec. 2.1.)

E. Energy

The Philippines is a country that is primarily dependent on imported oil to meet its energy needs. Local energy sources are being explored and developed in an attempt to reduce the country's dependence on foreign oil. One hundred fifty-eight oil and gas wells are scheduled to be drilled from 1980 to 1985. (Investment in ASEAN, Asia Trade News, 1981, p. 112.) Coal reserves in the Philippines are plentiful, and President Marcos has encouraged the use of such. Hydroelectric and geothermal energy sources are projected to produce 25 percent of the national power needs by 1985. (Id.) This subject is discussed further in the economic climate volume of this report.

F. Foreign Investments Assistance Center

The Foreign Investments Assistance Center (hereafter FIAC) is a "one-stop shop" for foreign investors desiring to set up business in the Philippines. It has "authority to act on any problems concerning the setting up of business by foreign investors." (Executive Order No. 845, Sec. 4.) The FIAC is composed of representatives from relevant government ministries, including the Ministry of Labor and Employment, Board of Investments, Central Bank of the Philippines, Securities and Exchange Commission, Export Processing Zone Authority, Human Settlements Regulatory Commission, Commission on Immigration and Deportation, and the Bureau of Internal Revenue. (Rules and Regulations Implementing Executive Order No. 845, Sec. 1.)

The FIAC performs a number of functions in assisting foreign businesses in setting up in the Philippines. This is done through "providing information, advice and guidance on investment laws and procedures, policies and guidelines, tax and customs matters related to foreign investments, on importation of machinery and equipment, on entry of foreign personnel, on technical contracts or agreements, and in the preparation and filing of applications." (Id., Sec. 3A.) In addition, the FIAC is empowered "to provide assistance in obtaining import licenses, land, buildings, materials, power and water facilities and other utilities necessary for operation of the business." (Id., Sec. 3B.) Once an application is filed by a foreign investor, it is supposed to be acted upon within one week by the FIAC. (Id., Sec. 4.)

Officials at the Board of Investment stress that FIAC performs liaison functions only, and has no authority to grant exceptions or exemptions to existing permit and other legal requirements. FIAC acts as a facilitator, a messenger of sorts, especially in the area of import/export permits (for plant/equipment necessary to set up a processing plant, for example) and incorporation. Officials as well as private members of the legal community also stress that status as a "pioneer industry," for which a processing plant would probably qualify, would be helpful in avoiding certain business restrictions such as tax credits and increased permissible percentage of foreign ownership, which is otherwise restricted if more than 30 percent foreign-owned. BI officials also noted in passing that it has in the past occasionally recommended that special laws be passed and regulations promulgated just for specific projects, depending upon the scale of investment and contribution to the economy. The President has apparently done so by decree for the semiconductor industry.

Services provided by the FIAC are:

a) Board of Investments

- (1) evaluation and approval/disapproval of applications to do business or to make investments or to register for incentives under the Investment Priorities Plan;
- (2) grant of authority to do business or the making of investments;
- (3) issuance of the certificate of registration to enterprises registered for incentives, where the foreign investments are to be made.

b) Ministry of Labor and Employment

- (1) issuance of employment permits to all foreign nationals;
- (2) providing information on available labor and manpower.

c) Central Bank of the Philippines

- (1) evaluation and approval/registration of foreign investments;
- (2) guarantee on repatriation of capital or remittances of earnings of registered foreign investments in accordance with Central Bank rules and regulations.

d) Securities and Exchange Commission

- (1) registration of corporations, partnerships and associations through which foreign investors will do business or in which investments are to be made;
- (2) assist foreign corporations on how to apply for a license to do business in the Philippines in accordance with Title XV (Foreign Corporations) of the Corporation Code of the Philippines;
- (3) provide information and assist multinational companies on how to establish their regional or area headquarters in the Philippines pursuant to PD No. 218, as amended;
- (4) assist foreign partnerships on how to transact business in the Philippines.

e) Export Processing Zone Authority

- (1) briefing on EPZA incentives, facilities, rules, systems and procedures;
- (2) arranging for zone visits;
- (3) acknowledging letters of intent;
- (4) commitment on space allocations;
- (5) acceptance of applications and feasibility studies;

- (6) tentative evaluation on applications and feasibility studies;
 - (7) providing information on approval of applications;
 - (8) arranging meetings with other EPZA officials;
 - (9) arrange for signing of registration agreements.
- f) Human Settlements Regulatory Commission
- (1) assistance in issuance of permits for plant locations;
 - (2) coordinating with government agencies as to particular location;
 - (3) assistance in environmental and socio-economic studies;
 - (4) assistance in site planning.
- g) Commission on Immigration and Deportation
- (1) assistance in the entry of foreign investor;
 - (2) allowing entry of foreign nationals and their families;
 - (3) providing information on immigration rules.
- h) Bureau of Internal Revenue
- (1) information assistance on taxes applicable to the foreign investor;
 - (2) facilitate any action relative thereto.
- i) Bureau of Customs
- (1) information assistance on customs rules;
 - (2) facilitate action relative to their offices.

(Id.)

FIAC's other relevant functions are discussed in the economic climate volume of this report.

G. Business Liability

A foreign enterprise is entitled to registration under the Investment Priorities Plan if:

- 1) 60% of the enterprise's capital stock is owned by Philippine nationals; or
- 2) It engages in a pioneer project set forth in the Investment Priorities Plan; and
 - a. Such pioneer area is not within one of the business areas reserved to Philippine nationals by the Constitution; and
 - b. That such enterprise obligates itself to bring itself to be 60-70% Filipino owned within 30 years. (Id., Art. 34-1.)

A pioneer project is defined in the Omnibus Investments Code as a registered enterprise:

- (1) engaged in the manufacture, processing or production, and not merely in the assembly or packaging of goods, products, commodities, or raw materials that have not been or are not being produced in the Philippines on a commercial scale or
- (2) which uses a design, formula, scheme, method, process, or system of production or transformation of any element, substance or raw material into another raw material or finished goods which is new and untried in the Philippines (Id., Art. 16.)

II. Real Property Law

The available methods of land acquisition open to foreigners in the Philippines, as they pertain to the acquisition of land for the operation of a foreign owned manganese nodule processing plant, are through ownership and lease.

A. Ownership of Land Is Limited to Philippine Citizens and Primarily Philippine Owned Corporations

Land ownership in the Philippines, whether public or private, is limited to citizens of the Philippines and primarily Philippine-owned corporations. The 1973 Constitution states "all lands of the public domain...belong to the State." (1973 Constitution, Art. XIV, Sec. 8.) The same Constitution provides that "the disposition, exploration, development, exploitation, or

utilization of any of the natural resources of the Philippines shall be limited to citizens of the Philippines, or to corporations, or associations at least sixty percentum of the capital of which is owned by such citizens...." (Id., Sec. 9.) As to U.S. private land ownership:

The rights and privileges granted to citizens of the United States or to corporations or associations owned or controlled by such citizens under the ordinance appended to the nineteen hundred and thirty-five constitution shall automatically terminate on the third day of July, nineteen hundred and seventy-four. Titles to private lands acquired by such persons before such date shall be valid as against other private persons only. (Id., Art. XVII, Sec. 11.)

The Philippine Supreme Court has held that all rights of United States citizens, corporations, and business enterprises owned and controlled by them cannot acquire title to private agricultural lands, and that any rights acquired by them under the 1935 Constitution, expired as of July 3, 1974. Republic of the Philippines v. Ouasha, 46 Phil. Sup. Ct. Rep. Ann. 160 at 178-79, 11 Intl. Legal Materials 1235 at 1251 (1972). In addition, the 1973 Constitution provides that "...no private land shall be transferred or conveyed except to individuals, corporations, or associations qualified to acquire or hold lands of the public domain." (1973 Constitution, Art. XIV, Sec. 14.) Thus, it is clear that in both the public and private land sectors, a foreigner is denied full ownership of land in the Philippines.

B. Water Permits Obtainable by Philippine Citizens and Juridical Persons Only

The acquisition of a water permit, which is vital to the operation of a manganese nodule processing plant, is limited to those of Philippine citizenship and "juridical persons." The Philippine Water Code states that "only citizens of the Philippines, of legal age, as well as juridical persons, who are duly qualified by law to exploit and develop water resources, may apply for water permits." (PD 1067, Art. 15.) A corporation or association that is at least sixty percent Filipino owned can probably be construed as a "juridical person" and qualify to apply for a water permit. Otherwise, the water rights would have to be leased from a holder of a water permit. This is permissible, as the Philippine Water Code provides that "water rights may be leased or transferred in whole or in part to another person with prior approval of the [National Water Resources] Council, after due notice and hearing." (Id., Art. 19.)

To obtain a water permit, an application must be filed with the National Water Resources Council, "who shall make known said application to the public for any protests." (*Id.*, Art. 16.) The National Water Resources Council, in determining whether to grant or deny a permit, considers "protests filed if any; prior permits granted; the availability of water; the water supply needed for beneficial use*; possible adverse effects; land use economics; and other relevant factors." (*Id.*) Once an application is approved, a water permit is issued. The permit specifies "the maximum amount of water which may be diverted or withdrawn, the maximum rate of diversion or withdrawal, the time or times during the year when water may be diverted or withdrawn, the point or points of diversion or location of wells, the place of use, the purposes for which water may be used, and such other requirements the [National Water Resources] Council deems desirable." (*Id.*, Art. 18.)

*Beneficial use is defined as "the utilization of water in the right amount during the period that the water is needed for producing the benefits for which the water is appropriated." (PD 1067, Art. 20.)

Once a permit is obtained, the holder of the permit may demand easements necessary to obtain the needed water. (See page 20, *supra*.) This right is a substantial asset in obtaining the water necessary to operate a manganese nodule processing plant.

A holder of a water permit is required to measure and keep records of the water that it uses. The Philippine Water Code mandates that "...every appropriator of water shall maintain water control and measuring devices, and keep records of water withdrawal when required by the [National Water Resources] Council, all appropriators of water shall furnish information on water use." (*Id.*, Art. 21.)

There is no set limitation as to the duration of a water permit. "Water permits shall continue to be valid as long as water is beneficially used...." (*Id.*, Art. 28.) However, there are instances where the permit may be suspended or revoked. A permit may be suspended on the following grounds.

- ...non-compliance with approved plans and specifications or schedules of water distribution;
- use of water for a purpose other than that for which it was granted;
- non-payment of water charges;
- wastage;
- failure to keep records of water diversion, when required;
- and violation of any term or condition of any permit or of rules and regulations promulgated by the [National Water Resources] Council. (*Id.*)

The following are grounds for which a water permit may be revoked.

[A] water permit may be revoked after due notice and hearing on grounds of non-use; gross violation of the conditions imposed in the permit; unauthorized sale of water; willful failure or refusal to comply with rules and regulations of any lawful order; pollution, public nuisance or acts detrimental to public health and safety; when the appropriator is found to be disqualified under the law to exploit and develop natural resources of the Philippines; when, in the case of irrigation, the land is converted to non-agricultural purposes; and other similar grounds. (Id., Art. 29.)

As long as a manganese nodule processing plant is operated in accordance with the basic rules and requirements that govern it, a water permit can be obtained, and continue for the full duration of the plant's operation.

C. Registration

The registration process requires basic information about the grantee, the instrument affecting the land, and the duplicate certificate of the owner of land. Important to note about the basic information required, is that "if the grantee is a corporation or association, the instrument must contain a recital to show that such corporation or association is legally qualified to acquire private lands." (Id., Sec. 55.) As to the instrument affecting the land and the duplicate certificate, both must be presented to the Register of Deeds in order to obtain a new certificate. The same decree provides that:

No voluntary instrument shall be registered by the Register of Deeds unless the owner's duplicate certificate is presented with such instrument.... The owner's duplicate certificate...shall be conclusive authority from the registered owner to the Register of Deeds to enter a new certificate or to make a memorandum of registration in accordance with such instrument, and the new certificate or memorandum shall be binding upon the registered owner and upon all persons claiming under him, in favor of every purchaser for value and in good faith. (Id., Sec. 53.)

A lease is registered in a similar manner. The Property Registration Decree provides that:

...All interests in registered land less than ownership shall be registered by filing with the Register of Deeds the instrument which creates or transfers or claims such interests and by a brief memorandum thereof made by the Register of Deeds upon the certificate of title, and signed by him. A similar memorandum shall also be made on the owner's duplicate.... (Id., Sec. 54.)

The lease takes effect upon the title only from the time of registration. (Id., Sec. 60.) The above procedure must be followed in registering lands that have been previously registered.

There are instances where the land in interest is unregistered. In such instances, any instrument affecting the land is invalid, except as between the interested parties, unless it is registered with the local Register of Deeds. (Id., Sec. 113.) A party desiring to register an instrument affecting unregistered land goes to the Register of Deeds, who determines whether or not the instrument is valid. The process of determination is described in the Property Registration Decree as follows.

If, on the face of the instrument, it appears that it is sufficient in law, the Register of Deeds, shall forthwith record the instrument.... In case the Register of Deeds refuses its admission to record, said official shall advise the party in interest in writing of the ground or grounds for his refusal.... (Id., Sec. 113b.)

If an appeal is necessary, the following procedure is followed.

When the Register of Deeds is in doubt with regard to the proper step to be taken or memorandum to be made in pursuance of any deed, mortgage, or other instrument presented to him for registration, or where any party in interest does not agree with the action taken by the Register of Deeds with reference to any such instrument, the question shall be submitted to the Commissioner of Land Registration by the Register of Deeds, or by the party in interest thru the Register of Deeds....the Commissioner of Land Registration...shall enter an order.... His...ruling...shall be conclusive and binding on all Registers of Deeds, provided, that the party in interest who disagrees with...the Commissioner...may appeal to the Court of Appeals.... (Id., Sec. 117.)

The procedures that must be followed, and the opportunities to appeal adverse decisions seem fair and reasonable. Thus, the registering of land should not present any problems in the establishment of a manganese nodule processing plant in the Philippines.

D. Leases

1. Public Lands

The government had earlier placed restrictions on the amount of leased public land that may be held by private corporations:

....No private corporation or association may hold alienable lands of the public domain except by lease not to exceed one thousand hectares in area.... No private corporation or association may hold by lease, concession, license, or permit, timber or forest lands and other timber or forest resources in excess of one hundred thousand hectares; however such area may be increased by the Batasang Pambansa upon recommendation of the National Economic and Development Authority. (1973 Constitution, Art. XIV, Sec. 11.)

It is worth noting the Batasang Pambansa has in fact increased the area which a private corporation may lease for mineral extraction purposes to 5000 hectares in any one province, up to 10,000 hectares in the country as a whole. Consolidated Mines Administrative Order, Ch. III, p. 5.

The 1973 Constitution provides the following in regards to lands of the public domain.

....With the exception of agricultural, industrial, or commercial, residential, and resettlement lands of the public domain, natural resources shall not be alienated, and no license, concession, or lease for the exploration, development, exploitation, or utilization of any of the natural resources shall be granted for a period exceeding twenty-five years, renewable for not more than twenty-five years, except as to water rights for...industrial uses.... (1973 Constitution, Art. XIV, Sec. 8, emphasis added).

This section can be construed to mean that there are no limitations on the length of leases for public land and water when the use is an industrial one. However, for the purpose of a

manganese nodule processing plant the duration of a lease of lands of the public domain to a foreign corporation is unclear. Moreover, under a mining lease provision (PD 463, Sec. 43), land not exceeding ten thousand hectares in any one province may be leased with the approval of the Minister of Mines and Geo-Sciences when circumstances inherent in the "operation" of a mining claim justify the grant.

In spite of the constitutional restrictions on foreign ownership of land, foreign investors may obtain property rights indirectly. In a recent policy switch and spur to foreign investments, the Central Bank was authorized by Executive Order to organize a real estate subsidiary to purchase real estate on behalf of foreigners. The real estate subsidiary would operate as follows:

1. Foreign investors interested in purchasing property for sale apply to the Central Bank subsidiary which will then buy the property.
2. The real estate subsidiary pays the owner of the property in pesos and leases the property to the foreign investor. Under the lease agreement, the foreign investor must pay the Central Bank in foreign currency.
3. The foreign investor reimburses the Central Bank for all transactional costs in acquisition of the leased property.
4. The real estate subsidiary owns the property but the foreign investor has full rights to the property. The investor is responsible for real estate taxes and maintenance expenses.
5. The foreign investor is assured of repatriation of profits or gains (subject to tax) if he decides to sell the property or withdraw his investment.

This scheme freezes the monthly rental payments on the property acquired and stabilizes this part of the operational cost of doing business.

It is thus possible that the government will assist investors in and developers of a manganese nodule processing plant in acquiring the land necessary for the operation of such a plant. PD 512 also states that "mineral...development and exploitation is hereby declared of public use and benefit, and for which the power of eminent domain may be invoked and exercised for the entry, acquisition and use of private lands...." (PD 512,

Sec. 1, emphasis added.) A manganese nodule processing plant could fall within the category of "mineral development and exploitation" for which the power of eminent domain may be used.

The only limitation would be if "mineral" includes only minerals extracted from Philippine soil. While there is no definition of "mineral" contained in PD 512, and the definition provided in PD 463 simply defines minerals as "...all naturally occurring inorganic substances in solid, liquid, or any intermediate state...." (PD 463, Chapter 1, Sec. 2f.), and while there is no mention of a requirement that such minerals be of Philippine origin, mining lawyers suggest that such a requirement is implied. Therefore while it is possible that a manganese nodule processing plant developing minerals brought from outside of the Philippines might be able to obtain the benefit of the use of the government's power of eminent domain in acquiring private land necessary to the operation of a manganese nodule processing plant in the Philippines, it is by no means certain.

Additional support for the use of eminent domain comes from mining law. A specific provision (PD 463, Sec. 59) allows a claim owner or lessee to prosecute the owner of private land in an action for eminent domain in the Regional Trial Court of the province where the land is located. Easement rights are also granted for "roads, railroads, mills, waste dump sites, warehouses and port facilities,...electric transmission...pipelines" for purposes associated with mining. (Id., Sec. 58.) Use of this section might involve the jurisdiction of the Bureau of Mines and Minerals which, as described below, might otherwise have none. Alternatively, foreign investors may enter into a joint venture with the National Development Company (NDC). By virtue of PD 1648 the NDC is empowered to hold public land in excess of areas permitted to private entities. Foreign companies may also enter into service agreements for development and exploitation of mineral resources with the government with the approval of the Minister of Agricultural and Mineral Resources (information from Doing Business in the Philippines 1982).

2. Private Lands

There are limitations on the duration of leases of private lands. A limitation on the duration of a lease to foreigners is set forth in PD 471 which states that "the maximum period allowable for the duration of leases of private lands to aliens or alien-owned corporations, associations, or entities not qualified to acquire private lands in the Philippines shall be twenty-five years, renewable for another period of twenty-five years upon mutual agreement of both lessor and lessee." (PD 471, Sec. 1.) The twenty-five year lease period for private land (once renewable) is compatible with mining provisions for twenty-five year mining lease contracts with the government (PD 463, Sec. 40).

As to the leasing of water, the Philippine Water Code provides that "water rights may be leased or transferred in whole or in part to another person with prior approval of the [National Water Resources] Council after due notice and hearing." (PD 1067, Art. 19.) Assuming that "another person" does not refer to only a Philippine citizen or a corporation that is predominantly Filipino owned, a foreign corporation doing business in the Philippines would be able to lease the needed water if approval is obtained from the National Water Resources Council.

III. Land Use Law

Land use law is the most relevant in finding a suitable location to establish a manganese nodule processing plant.

A. National Land Classification

Land is classified under the 1973 Constitution as being either "agricultural, industrial, timber or forest, grazing lands, and other classes as may be provided by law." (1973 Constitution, Art. XIV, Sec. 10.) Difficulties, if any, would arise in attempts to use agriculturally classified land. For example an agricultural lessee normally has a right to pre-emption if the lessor decides to sell the land (RA 3844, Sec. 11), but it is not applicable to land to be converted for industrial use: "...right of pre-emption and redemption...cannot be exercised over landholdings suitably located which the owner bought or holds for conversion into...industrial...purposes: Provided, however, that the conversion be in good faith and is substantially carried out within one year from the date of sale. Should the owner fail to comply with the above condition, the agricultural lessee shall have the right to repurchase...within one year after the...period for conversion has expired." (RA 3844, Sec. 14, emphasis added.) The conversion of agricultural lands is also regulated by P.D. 815 (known as the law governing conversion of agricultural land to urban uses) and the Rules and Regulations to Govern the Conversion of Agricultural Lands. The only exception is the conversion of agricultural lands located within a one thousand (1,000) meter strip, which is regulated by PD 399, and discussed below. (Rules and Regulations to Govern the Conversion of Agricultural Lands, Rule I, Sec. 2.) Application to and authorization of the Ministry of Agrarian Reform and favorable recommendations from the Human Settlements Regulatory Commission and the Ministry of Local Governments are required for conversion. (Id., Rule III, Sec. 2.) For an application to be approved, the need for the conversion must outweigh the economic and ecological value of the land in question to the country and community. (Id., Rule IV, Sec. 1.) Factors taken into consideration in determining whether conversion shall be allowed or not includes the following:

- a) Agricultural productivity of the area;
- b) Need of the national economy for the particular agricultural output to be affected;
- c) Availability of basic services such as water, electricity and roads;
- d) Proximity of the area to identified growth centers or priority areas;
- e) Possible effect of the conversion on the ecological stability of the area; and
- f) Applicant's ability to complete the intended development.

(Id., Sec. 2.)

A class of land provided by law is the limitation on the use of land located within 1,000 meters (500 meters on each side - Rules and Regulations Implementing PD 399, Rule II, Sec. 1z) "along any existing, proposed or on-going public highway or road until the government shall have...formulated a comprehensive and integrated land use and development plan." (PD 399, Title.) This law applies to both public and private land in communities which have no zoning or land use plans approved by the Human Settlements Regulatory Commission. (Rules and Regulations Implementing PD 399, Rule I, Sec. 1.) Priority use is for human settlements and land reform, and no development or improvement may be made on such land without approval from the Chairman of the Human Settlements Regulatory Commission. (PD 399, Sec. 2-3.) A locational clearance granted by the Human Settlements Regulatory Commission is required to develop or improve lands to which PD 399 applies. (Rules and Regulations Implementing PD 399, Rule I, Sec. 2b, Rule IV, Sec. 1.) Specific application requirements for a locational clearance are set forth in the Rules and Regulations Implementing PD 399, Rule IV. In addition to various form requirements, certification/clearances are required from:

- 1) ...the local chief executive that the proposed use is in accordance with the development plan of the locality, if there is any.... (Id., Sec. c)
- 2) ...the Department (now Ministry) of Agrarian Reform if the application is for the conversion of tenanted rice and corn lands to...industrial...uses.... (Id., Sec. d)
- 3) ...the National Pollution Control Commission.... (Id., Sec. g)

Once a locational clearance is granted, the applicant must "commence the physical development of the landholding subject of the application, within one (1) year from the receipt of the locational clearance...." (Id., Rule IV, Sec. 1.) These rules and decrees have since been collected (late 1983) into omnibus legislation, Rules and Regulations Governing Locational Clearances.

A host of restrictions and sophisticated controls apply to Manila and the surrounding urban area, but as there is insufficient land available for a manganese processing plant scheme (according to officials of the Metro Manila planning department) those are not discussed here.

B. Planning Responsibilities* at National/Local Level

At the national level, the Ministry of Human Settlements has responsibility for formulating national standards and guidelines for all land use plans and zoning ordinances. PD 1396 provides that "The [Ministry of Human Settlements] shall...undertake by itself or through the...commissions...placed under its supervision [to] promulgate national standards and guidelines for human settlements which shall govern land use plans and zoning ordinances of local governments, civil works and infrastructure programs and projects of the National Government, and subdivisions or estate development projects of both the public and private sectors." (PD 1396, Sec. 4.) This is done through the Human Settlements Regulatory Commission over which the Ministry of Human Settlements has supervision. The Human Settlements Regulatory Commission (HSRC) not only reviews local plans and zoning ordinances for conformance with national plans, but it also decides in the first instance whether or not to approve "projects of national significance"--a classification which would almost certainly apply to manganese nodule processing plants, according to officials at the Commission. It is therefore worth describing briefly what the Commission is and how it works.

*There are two "human settlements" entities that have planning responsibilities mentioned in this section: the Human Settlements Commission and the Ministry of Human Settlements (formerly the Department of Human Settlements). The Ministry of Human Settlements has supervision over the Human Settlements Commission (PD 1396, Sec. 14,15).

The HSRC has eight members: four full-time and appointed by the President of the Republic and four ex-officio (deputy ministers of Justice, Local Government and Public Works and Highways and the Deputy Director General of the National Economic Development Authority). One of the appointed Commissioners acts as the Chief Executive Officer. The other four have specific responsibilities, for example, planning, or enforcement. Each such Commissioner makes decisions in his or her particular area, which decision is appealable to the full Commission. Decisions of the Commission are appealable to the President of the Republic, who presently has complete discretion to overturn the Commission's decisions. The HSRC apparently gets the application for such a project of national significance directly from the Chief Executive Officer, which application is considered at an appropriately scheduled meeting. (*Id.*, Sec. 14, 15.) In planning for industries, the Environmental Code provides that "in the location of industries, factories, plants, depots and similar industrial establishments, the regulating or enforcing agencies of the government shall take into consideration the social, economic, geographic and significant environmental impact of said establishments." (PD 1152, Sec. 24.)

On the local level, local governmental bodies formulate development plans and ordinances that regulate the use of land in their respective areas. These local government entities include the municipal, city, and provincial legislative bodies (Sangguniang Barangay). One of the duties of the municipal legislative body (Sangguniang Bayan), as set forth in Local Government Code of 1975 (Batas Pambansy Blg. 337), is to "adopt zoning and subdivision ordinances and regulations and [a] building code." (The Local Government Code of 1975, Sec. 3.21.) At the city level, the exact same duty is required of its legislative body (Sangguniang Panlungsad). (*Id.*, Sec. 4.18.) At the provincial level, the provincial legislative body (Sangguniang Panlalawigan) is required to "adopt zoning and subdivision ordinances and regulations." (*Id.*, Sec. 5.22.) Essentially, the local land use process works as follows, according to HSRC staff attorneys:

1. The local administrative staff drafts a local land development plan in accordance with general national standards.
2. Then the local legislative body adopts the plan by resolution.
3. Then local zoning is adopted by ordinance by the same legislative body, in conformance with the plan (mayor can veto either, but can be overridden).
4. Either the plan or the zoning ordinance is amended by the same process.

Although the provincial governments, as regional governments, would in some areas of planning (e.g., financing of infrastructure, and so forth) be superior to the cities and villages, so far no province has submitted a zoning scheme to the HSRC for approval, so none is in force. In any event, there is some doubt whether a provincial zoning scheme, which would be fairly "broad-brush" in any event, would take precedence over an HSRC-approved local plan and conforming zoning ordinance. These plans and ordinances, pursuant to PD 933, are then forwarded to the Human Settlements Regulatory Commission for its review and concurrence according to national and regional standards. The extent of review of local plans and ordinances that the Commission is allowed is set out in PD 933:

...within the context of national and regional standards and guidelines, the preparation of local physical or zoning plans shall be undertaken by the appropriate local governments, to be embodied in local ordinances: Provided, however, that the concurrence of the [Human Settlements] Commission shall be obtained beforehand and: Provided further, that such concurrence shall be limited to the consistency of the local ordinance to the national and regional standards and guidelines and shall not extend to the utilization and/or classification of specific individual plots of land. (PD 933, Sec. 8c, emphasis added.)

The above planning and review process appears to be that followed in the formulation of land use plans and zoning ordinances for both rural and urban areas. According to Letter of Instruction No. 729, the process works like this:

- 1) The Ministry of Human Settlements (hereafter Ministry) prepares land use plans and zoning implementation and enforcement guidelines for urban and urbanizable areas which are submitted to the President-Prime Minister for their approval.
- 2) Local governments submit their land use plans, zoning ordinances enforcement systems and procedures to the Ministry for review and ratification.
- 3) The Ministry translates the approved land use plans and zoning implementing guidelines into official Zoning Maps which are printed and posted in municipal halls and other conspicuous places, bearing the seal of the Human Settlements Regulatory Commission. The Ministry is also required to publish the official Zoning Maps in a newspaper of general circulation.

- 4) The approved land use plans and implementing guidelines are implemented through the Ministry's regulating of the issuance of development permits. The Ministry appoints Zoning Administrators who shall issue such permits in coordination with the Ministry of Local Government and Community Development.
- 5) Any public or private developer is then required to submit their Development Proposals to the Ministry for their approval.
- 6) Upon receipt of a Development Proposal, the Ministry or its designate shall determine its conformance with approved zoning implementing guidelines, and may specify appropriate planning conditions. The Ministry may call for a public hearing on the development proposals, if it deems necessary.

(Letter of Instruction No. 729 found in the Philippine Official Gazette, Vol. 75, No. 4, Jan. 22, 1979, pp. 614-16.)

There are areas where no zoning laws or ordinances exist. In such a situation, the responsibility for determining the suitability of locating an industry rests with the local health authority. (PD 856, Sec. 46.)

Finally, the National Coordinating Council for Town Planning, Housing, and Zoning (NCCTPHZ) was created by LOI No. 511. However, it was eliminated in the late 1970's. The NCCTPHZ used to coordinate all planning efforts to harmonize national, regional and local activities. Town plans and zoning ordinances implementing the plans for 152 target sites had been completed and reviewed by the NCCTPHZ. Town Plan Implementing Conditions have been attached to town plans adopted by the selected potential sites for a manganese nodule processing plant. These conditions include:

- (1) Land use development shall follow a radial-circumferential pattern of expansion.
- (2) Provisions for support services such as hospitals, schools, ports, airports, roads, and water supply.
- (3) Standards for allocating the total area within the municipal boundaries (for example, 72 to 293 hectares for industrial uses).

(4) Special provisions for land use development

- (a) location of dumpsites.
- (b) applicability of National Building Code, Water Resources Code, Environmental Code, Human Settlements Regulatory Commission (HSRC) Rules and Regulations.
- (c) Urban development shall be located away from identified critical zones (fault zones, flood-prone areas, man-made hazards).
- (d) The town plan and zoning ordinance shall be revised at least once every five years subject to review by the HSRC.

The role of industry is crucial to development of growth centers since employment provides the incentive for attracting migrants. The proposed strategy of industrial dispersion accomplishes a number of objectives: (1) optimal utilization of human resources, (2) optimal utilization of natural resources to spur economic activities, (3) protection of the environment from adverse effects of overexpansion of manufacturing and extractive industries. Industries are classified as Resource-Oriented, Market-Oriented, or Footloose Industries to facilitate locational decisions. After locational approval for selected industries, BOI incentives will be granted to industries that locate in the specified area.

How the planning and environmental laws work in specific areas is set out in Section V following a discussion of relevant environmental and port laws.

C. Water Rights

Water is classified into various categories by the National Pollution Control Commission, in coordination with other appropriate governmental agencies. In classifying the water, the Commission takes into account such factors as:

- 1) The existing quality of the body of water at the time of classification;
- 2) The size, depth, surface area covered, volume, direction, rate of flow, gradient of stream; and
- 3) The most beneficial use of said bodies of water and lands bordering them for residential, agricultural, commercial, industrial, navigational, recreational, and aesthetic purposes. (PD 1152, Sec. 15.) Water

classifications are listed in The Rules and Regulations of the National Pollution Control Commission (1978), Section 68. In addition, where "the public interest so desires" or where "the quality of water has deteriorated to a degree where its state will adversely affect its best usage," the government may do whatever is necessary, including the revocation of water permits, to improve the quality of water. (Id., Sec. 16-17.)

A water permit is necessary to gain legal access to the water necessary for the operation of a manganese nodule processing plant. The Philippine Water Code declares that "[a]ll waters belong to the State." (PD 1067, Art. 3a.) It then defines such state owned water as "water under the ground...above the ground...in the atmosphere and the waters of the sea within the territorial jurisdiction of the Philippines." (Id., Art. 4.)

Water is appropriated for various purposes, one of which is industrial. (Id., Art. 10.) The use of water in a manganese nodule processing plant is thus a valid one. However, as discussed above in the Real Property Law section, only Philippine citizens "of legal age, as well as juridical persons, who are duly qualified by law to exploit and develop water resources, may apply for water permits." (Id., Art. 15.)

To obtain a water permit, an application must be filed with the National Water Resources Council, "who shall make known said application to the public for any protests." (Id., Art. 16.) The National Water Resources Council, in determining whether to grant or deny a permit, considers "protests filed if any; prior permits granted; the availability of water; the water supply needed for beneficial use; possible adverse effects; land use economics; and other relevant factors." (Id.)

Once a permit is obtained, the holder of the permit may demand easements necessary to obtain the needed water. The Philippine Water Code provides that:

A holder of a water permit may demand the establishment of easements necessary for the construction and maintenance of the works and facilities needed for the beneficial use of the waters to be appropriated, subject to the requirements of just compensation and to the following conditions:

- a. That he is the owner, lessee, mortgagee or one having real right over the land upon which he proposes to use water; and

- b. That the proposed easement is the most convenient and the least onerous to the servient estate.

Easements relating to the appropriation and use of waters may be modified by agreement of the contracting parties, provided the same is not contrary to law or prejudicial to third persons. (Id., Art. 25, emphasis added.)

This provision is a substantial asset that provides a government backed right to an easement for water necessary in the processing of manganese nodules.

The National Water Resources Council, however, has the power to modify or cancel water permits in favor of a project that is determined to be of greater beneficial use, or in the case of multi-purpose development. (Id., Art. 30.)

IV. Environmental Law

Environmental law is of fairly recent origin in the Philippines. There have been a fair number of presidential decrees in this area in the past few years, dividing the area into environmental impact and substantive environmental law systems, like what appears at the national level in the United States.

A. Organizational Structure

The National Environmental Protection Council (hereafter NEPC) is the governmental agency in charge of national environmental programs. It is "a central authority that will oversee, unify and integrate the planning, management and implementation of the government's environment program." (PD 1121, introduction.) A few of the NEPC's functions relevant to industry are the following:

- b) To formulate policies and issue guidelines for the establishment of environmental quality standards and environmental impact assessments (also known as environmental impact statements);
- e) To review environmental impact assessments of projects submitted by government agencies;
- f) To monitor development projects initiated by government and private agencies and to see to it that they are in line with priorities of the government on environmental protection; (Id., Sec. 3.)

The NEPC is an agency with which an industry interested in doing business in the Philippines must check to ascertain the appropriate rules and regulations in the area.

The National Pollution Control Commission (hereafter NPCC) was created under RA 3931 and revised by PD 984. NPCC is the primary agency responsible for the prevention and control of environmental pollution. It performs this function through the promulgation of appropriate rules and regulations, licensing and permitting of pollution control facilities, and the enforcement of environmental quality standards through the revocation, suspension or modification of permits and licenses. (PD 984, Sec. 5, PD 1152, Sec. 8.) NPCC is the "lead agency" that a manganese nodule processing plant will come in contact with on a regular basis as far as waste disposal and pollution control measures are concerned.

There are also local agencies which formulate policies and guidelines with which one must comply. "Local governments...may set up higher standards [than the national ones] subject to the written approval of the [National Pollution Control] Commission." (PD 984, Sec. 6i.)

B. Procedure for Applying for Necessary Environmental Permits

The NPCC is the "lead agency" to which a corporation interested in operating a manganese nodule processing plant in the Philippines must go to obtain a permit to operate. A "lead agency" is the governmental agency that has been given the responsibility over the area that will be affected. The lead agency assists the project proponent in determining whether or not the proposed project is environmentally critical or whether or not it will be located within an environmentally critical area. (Rules and Regulations of the NEPC Implementing PD 1586, Art. I, Sec. 3a.) If the project is deemed to be an environmentally non-critical one, the project proponent may proceed with the project. (Environmentally critical projects and areas are set forth in Proclamation No. 2146.)

The Rules and Regulations of the NPCC (1978) state that "no stationary installation or any activity, which will reasonably be expected to be a source of pollution, shall be constructed, operated, maintained, expanded or modified unless the same is covered by a currently valid permit issued by the NPCC." (Rules and Regulations of the NPCC (1978), Sec. 88.) In addition, a valid permit is also required for waste disposal and treatment systems. (Id.)

The application process for permits to construct and operate require the payment of a 50 peso filing fee for each

permit, (this is probably more now), and the filing of an "application for authority to construct" and an "application for permit to operate." Basic information, documents and data required by the NPCC with the "application for authority to construct" include:

- 1) an engineering report covering the plant description and operations, the types and quantities of all waste materials generated, whether liquid, gaseous or solid, the proposed waste control facilities, the treatment objectives, the design criteria and other relevant information. The design criteria, if warranted, shall be based on the results of laboratory and pilot plant scale studies. The design efficiencies of the proposed treatment facilities and the quantities and types of pollutants in the treated effluents or emissions shall be indicated. Where confidential records are involved, the Commission may limit the full disclosure of the same after personal discussions with the applicant;
- 2) the plans and specifications of the installation and its control facilities (in standard size of 50cm by 90cm) duly certified by any registered professional mechanical engineer, sanitary engineer or chemical engineer or a combination of any two or all of them as may be required by the Commission depending upon the nature of the construction, operation or activity sought to be covered by the authority to construct. The plans must clearly show in adequate detail the proposed arrangement, location and size of the pollution control equipment or facilities, including their accessories, cross-sections and construction details. The specifications shall be in sufficient detail so that when read in conjunction with the plans, they shall clearly reveal the proposed means and methods for the control of pollution and their expected performance efficiency; and
- 3) a vicinity map adequately identifying the street address, if any, the location or premises of the installation.

(Id., Sec. 91.)

Once the conditions of the "authority to construct" are met, the applicant files an "application for permit to operate." Required with such an application are:

- 1) A certification duly signed by the applicant or his engineer attesting to the completion of the construction, expansion, modification or alteration, as the case may be, of the installation, and showing the deviations from the plans, if any;
- 2) A statement of the final cost of the installation; and
- 3) A signed copy of the appointment or designation of the pollution control officer of the applicant.

After receiving the proper forms, the NPCC acts on the application by either issuing the permit or by "denying the application in writing stating the reason or reasons therefor." (*Id.*, Sec. 92 and 94.) The same sections also provide that "in case the application is denied, the applicant may, within 10 days from notice of such denial, file only one written petition for reconsideration. The decision on said petition shall become final after 10 days from receipt thereof." (*Id.*) Appeals on the NPCC's decision may be made to the Court of Appeals and to the Supreme Court, (*Id.*, Sec. 42, 43), and must be made within 15 days of notification of the NPCC's decision. (PD 984, Sec. 7c.)

A permit is generally good for one year, unless revoked or suspended. The NPCC has declared that "a permit duly issued by the Commission shall be valid for the period specified therein but not beyond one year from the date of issuance.... It may be renewed by filing an application for renewal at least thirty days before its expiry date...." (Rules and Regulations of the NPCC (1978), Sec. 96.)

A manganese nodule processing plant could be considered a "resource extractive industry" which includes the processing of metalliferous ores derived from marine mining (National Environmental Protection Council, Office Circular No. 3 Series of 1983 implementing Proclamation No. 2146). Therefore, the project must go through the Environmental Impact Statement System to obtain an Environmental Compliance/Clearance Certificate, which is necessary for operation. (PD 1586, Sec. 4.) The only exception to the Environmental Impact Statement (EIS) requirement in the case of an environmentally critical project is that of presidential exception. Also, under Presidential Decree No. 1586 Section 4, the President can himself issue a Certificate. Officials of NPCC stress that a Certificate has never been refused. Instead, pollution mitigation messages are attached as conditions to the Certificate. (Rules and Regulations of the NEPC

Implementing PD 1586, Art. II, Sec. 2.) A highly centralized system of processing the EIS in NEPC was instituted by PD 1586 which removed the bulk of processing work from the lead agencies authorized by PD 1151. The administrative system is streamlined for studies voluntarily undertaken as a matter of course, such as airports, ports and harbors, highways, and dams. An EIS may be required for these projects as a condition for the grant of a loan.

By virtue of PD 1121 the NEPC accepted responsibility for implementation of the EIS system. LOI No. 1179 provides:

- (a) the NEPC is authorized to:
 - (i) issue Environmental Compliance Certificates to any entity/firm which has complied with the EIS system requirements
 - (ii) grant exemption from the EIS system upon recommendation by the Minister concerned with the sector.
- (b) Ministries designated under PD 1586 which must form an environmental unit from their existing personnel to provide technical assistance in processing and evaluating the EIS.
- (c) PD 1586 specifies that only those projects that are environmentally critical will automatically fall within the purview of EIS requirements.

Once the project is implemented, the lead agency conducts regular monitoring of the project with respect to its effects on the environment. The NPCC may enter at all reasonable times any property of the public dominion and private property devoted to industrial, manufacturing, processing or commercial use without doing damage, for the purpose of inspecting and investigating conditions relating to pollution or possible or imminent pollution." (PD 984, Sec. 6n.)

It seems that a manganese nodule processing plant will be deemed to be an environmentally critical project. It is assumed that the plant would be able to gain approval and an Environmental Clearance Certificate from the NEPC because of the pollution control devices available and because of the great boost to the economy that a plant would bring.

C. Water and Air Pollution Control Measures*

Water quality standards are set by the National Pollution Control Commission (NPCC). (PD 1152, Sec. 8, 18.) According to the Philippine Water Code, "no person shall, without prior permission from the NPCC, build any works that may produce dangerous or noxious substances or perform any act which may result in the introduction of sewerage, industrial waste, or any pollutant into any source of water supply." (PD 1067, Art. 75, emphasis added.) Furthermore, tailings from mining operations "shall not be dumped into rivers and waterways" without explicit permission from the NPCC (Id. Art. 77). Officials of NPCC stress there are so far no pollution standards for manganese and related nodules, but it (manganese) is one of the "controlled substances" for effluent control/permit purposes.

A permit to dump tailings is usually conditioned upon treatment of such tailings prior to disposal. The Philippine Environmental Code provides that "wastewater from...industries...shall be treated either physically, biologically, or chemically prior to disposal in accordance with the rules and regulations promulgated by proper government authority." (PD 1152, Sec. 50.) See Appendix VII, Sec. 67d, g, h, i and 70 for rules and regulations pertaining to treatment of wastes prior to disposal.

PD 1251 imposes mine waste and tailings fees on mining companies as recommended by the Director of the Bureau of Mines and Geo-Sciences and approved by the Minister of Natural Resources. The Mines Environmental Control Section (created with the NEPC) is involved in implementation of the regulations governing mine waste and tailings. However, there is substantial uncertainty over the application of Philippine mining laws to a processing plant alone. Several lawyers in private practice stress that the laws were written to apply to processing only as part of mineral extraction. Therefore, given the nature of a manganese nodule processing plant, such laws would be inapplicable. The existing mining regime appears geared principally to regulating exploration and the export of minerals extracted from Philippine territory and territorial seas. This view is largely confirmed by attorneys with the Bureau of Mines.

*Specific standards are set forth in selected Rules and Regulations of the NPCC (1978) found in Appendix VII.

The Marine Pollution Decree of 1974 (PD 600 as amended by PD 979) governs the discharge of industrial waste into "any navigable water of the Philippines." The Philippine Coast Guard (PCG) is given authority to "enforce laws, promulgate and administer rules and regulations" for the prevention and control of marine pollution in coordination with the National Pollution Control Commission (PD 601, Sec. 5p). The Commandant of the PCG may permit ocean dumping whenever navigation will not be injured. The NPCC, on the other hand, promulgates national rules and policies for marine pollution, including discharge of effluents from ocean outfall structures (PD 979, Sec. 5). Penalties for violations of the terms and conditions of a dumping permit range from 200-10,000 pesos and/or imprisonment for thirty days to a year for each offense (Id., Sec. 7).

Once tailings are dumped, if a water pollution incident does occur, under the Philippine Environmental Code, the polluter is required to clean up the water pollution at its own expense. If such polluter fails to do so, the governmental agencies concerned will do so, and the polluter will be charged with the expenses incurred. (Id., Sec. 20.)

Air quality standards, like those of water, are set by the NPCC. Industries are required to establish an air quality monitoring network. Air pollution monitoring equipment must be installed and maintained by the owner of the plant who must also keep emission records. (Philippine Environmental Quality: Annual Report, National Environmental Protection Council, 1977, p. 29.) Incentives in the form of tax credits and deductions are given for investment in pollution control equipment. (PD 1152, Sec. 56-57.) In particular, officials of NPCC indicate a permit for particulates would be necessary for a processing plant, though ore processing per se is not an activity listed as needing a permit.

Industrial citing occurs when a person or corporation performs certain activities without first securing the required permit(s) from the relevant agency/agencies concerned. The Rules and Regulations of the NPCC (1978) provide that the following acts are prohibited in the absence of a permit.

- a) the construction, installation, modification or operation of sewage works or any extension or addition thereto;
- b) the increase in volume or strength of any wastes in excess of the permitted discharge specified under any existing permit;

- c) the construction, installation or operation of any industrial or commercial establishments or any extension or modification thereof or addition thereto, the operation of which would cause an increase in the discharge of wastes directly into the water, air and/or land resources of the Philippines or would otherwise alter their physical, chemical or biological properties in any manner not already lawfully authorized; and
- d) the construction or use of any new outlet for the discharge of any waste, gaseous or liquid, directly into the water, air and/or land resources of the Philippines.

(Rules and Regulations of the NPCC (1978), Sec. 104.)

Additional prohibitions include the following.

- a) performance of any act or activity or omission in violation of the Order of Decision of the [National Pollution Control] Commission or prohibited by the Rules and Regulations [of the NPCC (1978)];
- b) refusing, obstructing or hampering the entry of authorized representatives of the Commission into any property devoted to industrial, manufacturing, processing or commercial use during reasonable hours for the purpose of inspecting or investigating the conditions therein relating to pollution or possible or imminent pollution; and
- c) misconduct in the presence of the Commissioners or any of the duly designated hearing officers during inquiries, investigations and proceedings being conducted, or so near them as to seriously interrupt any hearing or session or any proceeding, or any person who willfully fails or refuses, without just cause, to comply with a summons, subpoena duces tecum issued by the Commissioners or by the duly designated hearing officer or, being present at a hearing, session or investigation, refuses to be sworn as a witness or to answer questions when lawfully required to do so.

(Id., Sec. 105.)

Penalties for violation of the above prohibitions are found in Appendix VII, Sec. 106.

Finally, it is important to note that industries are required to restore the land to the fullest extent possible, to

the condition before the project was undertaken. (PD 1198, Sec. 1.) This decree is addressed to industries that exploit Philippine natural resources, but there is the possibility that it could be applied to a manganese nodule processing plant also.

D. Ports Regulatory Authority

The Revised Charter of the Philippine Ports Authority (PD 857 as amended by Executive Orders Nos. 513 and 546) provides the framework for development and operation of Ports or Port Districts for the entire country. The PPA is attached to the Ministry of Public Works (E.O. No. 546) with its principal office in Metro Manila. Among the duties of the PPA: (i) the formulation of a comprehensive Port Development Plan in coordination with the National Economic and Development Authority, (ii) supervision, regulation, and licensing of port construction and port facilities, (iii) administration and development of foreshore areas vested in the PPA, and (iv) regulation and supervision of pilots. Section 21 provides for remission of dues, rates, or charges when the State has arrangements with foreign governments with respect to vessels not normally engaged in conveyance of cargo or passengers.

The General Port Regulations (PPA Admin. Order No. 13-77) specifies requirements for arrivals and departures, shipping operations and movements, and loading/unloading or storing of goods (defined as "any moveable property"). Furthermore, Sections 104-109 set out guidelines for construction and operation of private ports and warehouses. The general policy of the PPA is to encourage and optimize the use of existing facilities. But, where a private port facility is needed for a specific commodity of exports or imports requiring special cargo handling equipment and the port is consistent with overall national development plans, such private ports are encouraged. Detailed feasibility studies should be submitted to the PPA. The permit to construct and operate a private facility is limited to 15 years, renewable for 10 years at the option of the PPA. A permit requires the proponent to pay the PPA 0.1% of the total estimated cost of the port, including piers, wharf, and other facilities. Additionally, the operator of a private wharf facility must pay the PPA a "reasonable rental and/or share of the total gross earnings derived from the operations thereof" as determined by the PPA on the basis of the "financial viability of the operations." (Sec. 104 (o).) A private lease application for warehousing facilities must be accompanied by plans and specifications vicinity maps, and tax clearance from the Bureau of Internal Revenue. Application papers are submitted to the PPA Port Management Unit of the port where the land to be leased is located. Leases are limited to 15 years, renewable for 10 years and subject to terms and conditions the PPA may deem proper to impose. Rate of rental is determined by reasonable return of investment, value of property involved, and cost of maintenance and development by PPA (Sec. 109).

All adverse decisions by the Port Manager/Officer in Charge on port charges are appealed to the General Manager and then to the PPA Board. If the adverse decision is affirmed by the Board, the decision may be appealed within 30 days to the Office of the President.

V. Conclusion

This report has covered Philippine property, land use, and environmental laws affecting the location of a U.S. owned manganese nodule processing plant in the Philippines.

The various laws discussed in this report will, of course, have an effect on a manganese nodule processing plant operating in the Philippines. In this section, we discuss these laws and their effects on a plant through a discussion of applicable permit requirements. These include the obtaining of a business license, water permit, pollution control permit, and the registering of land. This conclusory section finishes with potential sites we were able to develop through materials provided by the Philippine Ministry of Human Resources.

A. Land Registration and Licenses

1. Obtaining a Business License

A manganese nodule processing plant locating in the Philippines must register with the Board of Investments as discussed in the previous section. (PD 1789, Art. 69.) An enterprise registers under the Investment Priorities Plan or as a foreign investment without incentives. There are no manganese nodule processing plants operating in the Philippines. Therefore, it is likely that a plant could qualify as a pioneer project under definition 2). Qualifying under definition 1) might be difficult because of the large copper industry in the Philippines. Registering as a pioneer enterprise would alleviate local stock ownership problems, as up to 100% of the stock in a pioneer enterprise can be foreign owned.

The Board of Investments would grant the consortium a written certificate of registration upon its meeting the requirements in PD 1789 and 1892 with respect to percent of foreign ownership (30%-100% depending upon various permissions and conditions) are Constitutional requirements.

A manganese nodule processing plant consortium, once registered with the Board of Investments, would then obtain a license to transact business in the Philippines from the Securities and Exchange Commission. In addition, the application for a license must contain the following:

[An] attached...certificate...attesting...that the laws of the country or state of the applicant allow Filipino citizens and corporations to do business therein and that the applicant is an existing corporation in good standing....[and also] a statement under oath of the president or any other person authorized by the corporation, showing to the satisfaction of the Securities and Exchange Commission and other governmental agency in the proper cases that the applicant is solvent and in sound financial condition, and setting forth the assets and liabilities of the corporation as of the date not exceeding one (1) year immediately prior to the filing of the application.... (Batas Pambansa Bldg. 68, Sec. 125.)

The Securities and Exchange Commission also requires a deposit from the newly licensed corporation. Once the licensee ceases to do business in the Philippines, the deposited securities are returned to the licensee upon its showing of proof that it has no liability to any Philippine residents. Unless the license were revoked or suspended, the license will continue for the duration needed to operate a manganese nodule processing plant in the Philippines (Id., Section 126.)

2. Registering Land

Land owned or leased for a processing plant would have to be registered, because "no deed, mortgage, lease, or other voluntary instrument, except a will purporting to convey or affect registered land shall take effect as a conveyance to bind the land, but shall operate only as a contract between the parties...." (PD 1529, Sec. 51.) The act of registration is the "operative act" which affects the land, and must "be made in the office of the Register of Deeds for the province or city where the land lies." (Id.) As noted supra, the registration process is critical to assure rights to proceed.

3. Water Permit

A water permit is necessary to gain legal access to the water necessary for the operation of a manganese nodule processing plant. As discussed supra, the permit from the National Water Resources Council is required for the plant's processing requirements.

4. Pollution Control Permits

Permits from the National Pollution Control Commission (NPCC) are required to construct a manganese nodule processing plant. As noted supra, this would involve both construction and operating permits from NPCC and EIS analysis supervised by NERC, and air and water clearances, given the prospect of particulate and other emissions and the need to potentially discharge into the shore area of the ocean tailings.

5. Land Use Factors In Three Potential Sites

The various permits and registration requirements set out in part A above deal largely with general requirements which would be enforced throughout the Philippines. This section describes three potential sites from a land use planning and regulatory perspective, in accordance with a Ministry of Human Settlements policy of developing regional areas in a heirarchical manner. It is worth noting at this point that the National Economic Development Authority (NEDA) also has a role to play here under a Letter of Instruction (LOI) 1350, which also creates a National Land Use Committee (NLUC) to conduct land resources surveys nationally as a basis for drawing up a national land use plan. A report of the NLUC was pending before the President for his approval at the beginning of 1985.

Through (1) A National Multi-Year Human Settlements Plan 1978 to 2000 which integrates physical planning goals, policies and area development strategies for the country, and (2) Regional Multi-Year Human Settlement Plans which define regional implications of the land use plan and identify the settlement locations slated for improvements in services and infrastructure, the Ministry plans for development in metropolitan centers, provincial centers, municipal centers, and barangays (community centers) where a rational allocation of resources allows the adoption of a heirarchy of settlements. The selection of growth centers for the future is based primarily on population size, growth trends, and potentials based on geography.

As discussed in the survey portion of this Chapter, the Regional Plans recognize that land in the Philippines is a limited resource. The expansion of settlements must be planned to minimize undirected development and adverse ecological impact. The Land Use Plan considers the most important determinants of land use as slope characteristics and land capability. The land use policy for each region allows some flexibility in local planning and development efforts by incorporating a general land use plan with compatible uses aside from those designated in the Land Use Plan. Expansion of urban and rural settlements is regulated by local land use and zoning plans. No expansion is allowed in areas designated as croplands, pasture, inland fisheries, forest or mining. For all other resources of the region (minerals, tourism, water) the development approaches aim

at optimizing utilization while maintaining the ecological balance. Unique resources are protected.

a. Tacloban City

(1) Resources and Infrastructure

Tacloban City is the major trading center and provincial capital of Leyte, and a national government regional center of the Eastern Visayas region. The city is located on the mid-eastern coast of the island of Leyte, which together with the island of Samar and the sub-province of Biliran comprises the Eastern Visayas region.

The current population of Tacloban City is about 110,000.

The local government is composed of 21 different departments and offices under the management of the City Mayor. The City Planning and Development Board (CPDB) is the advisory and implementing body of the Sangguniang Panglungsod (SP). The SP is the local legislature or "city council" and has 15 members, 5 of which are also members of the CPDB. The other members of the CPDB are the City Development Coordinator, City Engineer, City Treasurer, City Development Officer, City Superintendent of Schools, and representatives from business, civic organizations, and religious sectors. The City Mayor is the Chairman of the CPDB.

The City Development Coordinator is executive secretary of the CPDB and also heads the City Planning and Development Staff (CPDS). The CPDS conducts research, planning, programming and evaluation for the CPDB. The CPDS also provides staff support and assistance to the CPDB and other offices relative to development planning.

The existing port facilities include a marginal wharf 1,108 meters long which accommodates 4 inter-island vessels, 3 ocean-going ships and numerous inter-coastal vessels. Nevertheless, the port cannot accommodate dozens of fishing vessels that call simultaneously at the port almost daily. A port improvement plan before the national government includes a 215 meter marginal wharf extension along the eastern side of the port.

While the average depth of the harbor is 35 feet, there are proposals before the city to dredge the harbor entry canal from Dio Island to the wharf area in order to accommodate larger foreign vessels. The national government also plans to build three finger piers and cargo sheds in the western portion of the harbor to supplement the limited warehousing services.

The Leyte Electrical Cooperative (LeyeCo) has a current capacity to generate 11,000 KW. Of this total capacity, the 36 major industrial users consume about 3000 KW. The National Electrification Administration (NEA) has planned 7 geothermal electric cooperatives of 55 MW each for the island of Leyte. In addition, the Tongonan Geothermal plant will soon supply 3000 KW (3 MW) from a plant which taps one of the many hot springs in the interior region. Frequent brown-outs are a recurrent problem in Tacloban City.

In general, the Eastern Visayas region has a surplus of water resources.

(2) Zoning and Land Use

In 1977, the Sangguniang Panglunsod (SP) enacted a Comprehensive Zoning Ordinance (CZO) for the City of Tacloban based on the Comprehensive Development Plan prepared by the City Planning and Development Board (CPDB). Assuming a nodule processing plant is compatible with I-2 District zoning (Pollutive industrial uses), the use regulations in an I-1 District are clearly defined. The six classifications of industrial use range from pollutive and non-hazardous (P/NH) to highly pollutive and extremely hazardous (HP/EH). Dumping sites must meet certain public health and sanitary requirements and a special permit is required from the Zoning Administrator (Comprehensive Zoning Ordinance, Art. VI, sec. 4). Effective pollution control is accomplished by requiring a locational clearance from the Human Settlements Commission.

Article VII Section 2 of the CZO provides for the powers and duties of the Zoning Administrator as the chief zoning officer to grant or deny zoning exceptions and variances, certificates of zoning compliance and to enforce the provisions of the CZO. Decisions by the Zoning Administrator may be appealed to the Zoning Board of Appeals with due notice and opportunity to be heard afforded to each party (Sec. 6).

One of the stated goals of the CPDB for the next 5-15 years is to "promote the growth and development of labor-intensive industrial investments as extractive industries." (The Framework Plan of Tacloban City, p. 24b.) The city's overall industrial objective is to "tap the resources and potentials of the city to make it attractive to local, national, and foreign investments" so long as the industries promoted do not inflict "intolerable damage to [the] surrounding environment." (Comprehensive development Plan, p. 241.) To achieve this goal for the urban core, only non-polluting and non-hazardous industries are allowed in specific limited areas. Heavy industrial zones are proposed for coastal areas north of the city.

In summary, Tacloban City is an attractive prospect for a manganese nodule processing plant site. A number of positive factors are evident:

1. the port facilities may be easily adapted for large nodule-transport vessels (there are current dredging plan proposals)
2. water resources are plentiful
3. industrial zones are coastal and in close proximity to the port
4. Tacloban is both a government regional center and a major trading center.
5. large-scale electrification plans (geothermal and hydroelectric) will eventually produce cheap power
6. some raw materials are locally produced and available (cement, limestone, lime)
7. the local government is enthusiastic about cooperating with industrial development
8. there are Board of Investment incentives to locate in the region as part of a nation program for dispersion of resource-oriented industry

However, geothermal and hydroelectric power is not currently available, even though the government's objective is to provide cheap power by the year 2000. Also, while the labor force is large, it is relatively unskilled in industrial tasks and vocational training may be needed.

b. Davao City

(1) Resources and Infrastructure

Davao City is the metropolitan center for the Southern Mindanao region, located in Davao del Sur, a Pacific coast province. The region has two rugged mountain ranges: the Dinato and Central Mindanao ranges. In addition, there are widespread volcanic mountains. The geologic features provide some

of the Philippines largest mineral resources. This includes the largest known deposits of metallic mineral ores, the fifth largest coal deposits, chromite (second largest deposits), copper and nickel. A diversified agriculture provides 45% of the economic base while industry contributes 16%. The total population of Southern Mindanao was about 2.7 million in 1975; 680,000 people live in Davao City. The total labor force for the city is currently estimated at 230,000 people, of which 135,000 are employed in industrial and service-oriented work. By the year 2000 the labor force will have grown to over 500,000. A number of training programs are sponsored by joint local-national government projects to provide job skills for heavy equipment and machinery, construction, and other industrial areas.

The City of Davao municipal government is composed of executive (City Mayor), legislative (Sangguniang Panglunsod), and judiciary branches. The Sangguniang Panglunsod (SP) created the City Planning and Development Board (CPDB) in 1974 (Ord. No. 1263). While this ordinance stipulated, inter alia, the duties and powers of the CPDB, it contained no provisions for the future role of a City Planning and Development Staff (CPDS) within the municipal government. Consequently, the CPDS faces a number of problems in establishing an effective, consistent planning and zoning scheme. Currently, the qualification and enforcement of land use controls is conducted by other agencies of the city administration. This is true, apparently, even though a comprehensive development plan for the city is being drafted by the CPDS for approval by the CPDB. A new organizational structure and strategy for implementing CPDS functions is proposed in the Comprehensive Plan of Davao City First Draft.

The projected power demands for the city suggest a grave deficiency in the city's power distribution and inadequacy of power sources. To combat continuing periodic brown-outs and electrical shortage, the national government is embarking on an ambitious project to provide 17 thermal and geothermal plants throughout Southern Mindanao. A geothermal plant in Davao del Sur delivering 6 MW is planned for completion by 2000. Current industrial requirements of 4.6 MW are expected to triple in Davao City by then. The water resources in Southern Mindanao are more than adequate for projected uses.

While the port of Davao City is the major port in Southern Mindanao, a description of the harbor and its facilities was not available at this time.

(2) Land Use and Zoning

The Comprehensive Plan of Davao City (CPDC) cites the overall goal for large-scale industry as

"sustained support in acceleration of industrial activity" to achieve economic stability and committed support to environmental protection and conservation (pp. 2-3, CPDC, First Draft). The Panacan area has been selected as the site for large industrial developments and is within the industrial estate identified in the NEDA Nationwide Industrial Development Program. Panacan developments are afforded special attention and cooperation with the national government to boost the economy of Davao City. Panacan is a coastal area in the northern part of the city, just north of the international airport and opposite the offshore island of Samal. One hundred fifty million pesos have been allotted to development of this "industrial estate" by local and national agencies (Table 2, p. 9, CPDC).

c. Surigao City

(1) Resources and Infrastructure

Surigao City is the provincial capital of the northernmost province of the Northern Mindanao region. The total population of the region is about 2.6 million. High immigration rates are expected to double the population by the year 2000. The Surigao port serves as an outlet-inlet route for the northern part of the region and is a definite asset to the region's industrial strategy of export diversification. A national scheme proposes to upgrade the port to a "tertiary" port ranking.

Several electrification projects will soon provide a cheap source of power to the provinces of Surigao del Norte. The Daiwan H E project and Wawa River project are both hydroelectric plants which will provide 70 MW and 20 MW, respectively, when completed within 10-15 years.

The water resources in the Northern Mindanao are plentiful due to the evenly distributed rainfall throughout the year. ("Realizing the Vision of a New Society," the Human Settlements Plan for 1978-2000, Region 10 Northern Mindanao, published by the Ministry of Human Settlements, Makati, Metro Manila.)

(2) Zoning and Land Use

A Comprehensive Zoning Ordinance (No. 85) was adopted by the Sangguniang Panglunsod of Surigao in 1980. The Ordinance was largely based upon City Planning and Development Board Development Plan for Surigao, and zone and district plans prepared for the city by the City Planning and Development Staff (CPDS).

To establish a manganese nodule processing plant, the development plan must be approved by the CPDB prior to the issuance of a building permit. The development plan for a processing plant must include the site plan with location of buildings, parking lots, storage and loading facilities, and features of the general landscaping scheme. Following the review of the development plans by the CPDB, adverse decisions may be appealed directly to the SP. (Comprehensive Zoning Ordinance, Sec. 5). The premises must be developed in "substantial conformance" with the approved plans as determined by the Zoning Administrator.

The use regulations for an I-3 district are established for heavy industries as highly pollutive/non-hazardous, highly-pollutive/hazardous, and highly-pollutive/extremely hazardous. Presumably a manganese nodule processing plant would be classified as highly-pollutive/hazardous (non-ferrous metal basic industries are listed in this category). Air contaminants, noise, and electrical disturbances "shall not be permitted to emanate beyond the premises." (*Id.*, Sec. 12.) Air contaminants include, inter alia, smoke, dust, noxious acids, fumes, gasses, odors or particulate matter.

Article VI of the CZO sets out the environmental management and performance standards. Industrial waste "shall be disposed of only in a manner which will not create any nuisance or danger to adjoining property ro [sic] to the community in general." (*Id.*, Sec. 1.) Sewage disposal must comply with National Pollution Control Commission regulations. A locational clearance from the Human Settlements Commission must be obtained as well as a certificate of anti-pollution compliance from the NPCC. An environmental impact Statement may be required for review by the City Pollution Control Officer (*Id.*, Sec. 3); forms may be obtained from the office of the Pollution Control Officer.

Article VII sets out the enforcement provisions of the CZO. The Zoning Administrator and Zoning Inspector are charged with most administrative tasks. They may grant exceptions, serve notice of violations, and the Zoning Administrator issues zoning certificates. The certificate of zoning compliance is issued in accordance with the National Building Code prior to a building permit and expires if not used within one year (*Id.*, Sec. 4-5). Following construction, a certificate of zoning clearance must be obtained before occupation of the building is allowed.

Appeals to decisions by the Zoning Administrator must be filed with the Zoning Board of Adjustment within 30 days of an adverse decision. A majority vote is

required to reverse an order of the Zoning Administrator or to "effect variation in this ordinance" (Id., Sec. 8). Any questions or appeals involving the interpretation or application of the development plan, or the national rules and regulations in land use planning are directed to the Human Settlements Ministry.

Currently only a few acres of Surigao City are zoned for industrial purposes (Blueprints For Desired Development, National Coordinating Council for Town Planning Housing, and Zoning, published by Ministry of Human Settlements).

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C. A. Reyes Santos	Board of Investments	Manila
Josefino C. Saysay	Bureau of Mines and Geo-Sciences	"
Alfredo F. Tadiar	University of the Philippines	Quezon City
Amado S. Tolentino, Jr.	National Environmental Protection Council	"
Bridget Valenton	Bureau of Mines and Geo-Sciences	Manila
Pedro P. Viray	National Pollution Control Commission	"
Veronica R. Villavicencio	National Environmental Protection Council	Quezon City
Leandro Vilorio	University of the Philippines	"

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P A R T I I

E C O N O M I C A N D I N V E S T M E N T C L I M A T E S U R V E Y

Part II

ECONOMIC AND BUSINESS INVESTMENT CLIMATES
FOR MANGANESE NODULE PROCESSING
IN SIX PACIFIC COUNTRIES

PART II

SUMMARY OF THE ECONOMIC AND INVESTMENT CLIMATES IN SIX COUNTRIES^a

ABSTRACT

Part II of this study suggests a framework for examining the economic and business investment climates in countries being considered for a large manganese nodule processing plant. Six representative Pacific countries were examined to illustrate important factors that should be included in country investment climate studies. These factors are grouped into four categories: (1) foreign investment attitudes, (2) country economic risk, (3) political risk, and (4) project risk. The second section of this study contains a detailed description and analysis of Australia, Canada, Colombia, Ecuador, Fiji, and the Philippines.

INTRODUCTION

All transnational corporations (hereafter TNCs) have procedures for deciding to undertake major investments in foreign countries. Historically, the dominant factor was whether the proposed investment met the TNC's profit criteria and whether the project fit in with the TNC's strategic goals. During the past 20 years many TNCs lost a great deal of money by following purely "financial strategies." A major problem is that the political

^aU.S. dollars are used throughout this report. All units are metric unless otherwise stated.

and investment environments in many countries have changed dramatically, resulting in substantial decreases or elimination of profits to TNCs in these countries. In particular, mineral projects have been among the most risky investments according to a study of 260 expropriations shown in Table 1. The reasons for this are complex, but often center on the relatively large size (high visibility) of the mineral projects in the economies, and the frequently strong feelings of nationalism associated with a nation's depletable mineral assets. Many developing country governments have encountered serious financial solvency problems resulting, in part, from the rapid increase in import costs for petroleum since 1973. In an attempt to cure short-term financial problems, governments have applied restrictive measures to reduce the outflow of foreign exchange. This has often resulted in a direct reduction in hard currency profits of TNCs.

In an attempt to better predict future changes that will have an impact on TNC profitability, many TNCs now regularly undertake political and country risk analysis to supplement project technical and economic analysis that previously dominated the investment decision.

During the 1970s there was a proliferation of techniques and experts in the field of political and country risk analysis. However, it must be emphasized that there are no reliable methods for predicting the political and economic stability of countries over the long periods required for major minerals processing investments (commonly 20 years). Analysts can probably pick the majority of low-risk and high-risk countries, but countries in

TABLE 1
EXPROPRIATION BY INDUSTRY GROUP, 1960-1974

Industry	Number of Expropriations	Percent of Total U.S. Investments
Oil	84	12
Mining and Processing	38	18
Utilities and Transportation	17	4
Insurance and Banking	33	4
Manufacturing	30	1
Agriculture	19	n.a.
Sales and Service	16	n.a.
Land and Construction	23	n.a.

(Bradley, 1977)

the middle group, perhaps 50 to 70 percent of the countries, are exceedingly difficult to predict. Most analysts would agree that countries like Iran, Libya, and Zaire are high risk and Australia, Canada, Singapore, and the U.S. are low risk; but what about countries in the middle group such as Colombia, Brazil, and Indonesia?

There is no single set of analytic criteria or ranking system available that can accurately rank all countries, particularly with respect to long-term investments such as a nodule processing plant. In the present study, four different ranking criteria were selected that are believed to be useful in making preliminary selections among countries for the siting of a nodule processing plant. The four ranking criteria are as follows:

- (1) Foreign Investment Attitudes
- (2) Country Economic Risk
- (3) Political Risk
- (4) Project Risk

This section of the study summarizes the findings for each of the criteria listed above, and provides a best overall ranking of the six countries. The second part of this study provides more detailed information on each country relevant to evaluating their economic and business climates. The field research for this study included visits to all six countries and, where practical, visits to the port sites where a nodule processing plant might be located. Appendix I contains a list of the government and industry contacts in each country.

I. FOREIGN INVESTMENT ATTITUDES

Government representatives in all countries, except the Philippines, indicated a strong interest in having a major nodule processing site located in their country. In the Philippines, government officials indicated a general interest in obtaining foreign investment which might include a nodule processing plant. All six countries are signatories to the United Nations Convention on the Law of the Sea (Simmonds, 1983). It was the informal view of officials and experts in each country (an official view was not obtained) that companies wanting to process nodules mined in countervention of the Law of the Sea Treaty would face serious difficulties in obtaining government approval. Government officials' views pertaining to nodule processing in each country are based on the assumption that the problems the U.S. government has with the Law of the Sea Treaty are resolved.

In order to understand the "actual" investment climate in each country, it is necessary to look deeper than the almost universal public statements of governments that private investment is welcome. An indirect measure of whether a country has a positive attitude toward foreign investment is the level and trend in foreign investment over time. Unfortunately, consistent and complete investment figures are not readily available for all six countries studied. The most consistent data time-series is for capital expenditures by majority-owned foreign affiliates of U.S. companies. This series, shown in Figure 1, indicates that Canada receives about four times as much U.S. investment as the next most favored nation, Australia.

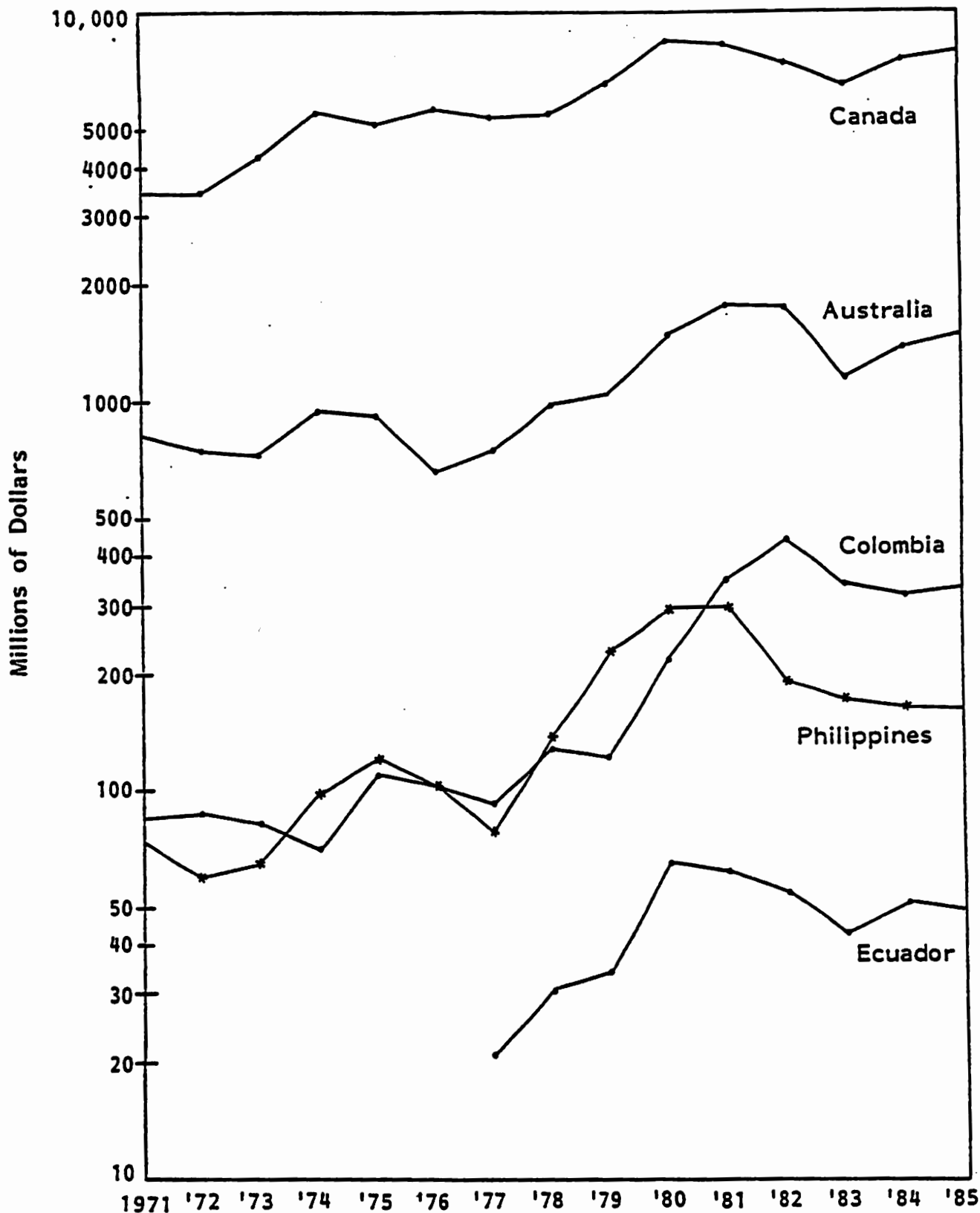


Figure 1. Capital Expenditures by Majority-Owned Affiliates of U.S. Companies (all industries)

Source: U.S. Commerce Department, 1971-1984

Colombia is in third place with about one-quarter the investment of Australia, followed by the Philippines and Ecuador. Fiji, which is the smallest economy studied, is not included in the series because of lack of data. It should be noted that substantial U.S. investments are not included, particularly for Colombia and Ecuador, who have tended to discourage investments having foreign equity control (over 50 percent). Because large economies will normally have higher levels of foreign investment, foreign investment figures can be put on a more comparable basis by dividing by GNP.

Table 2 provides a subjective summary and relative ranking of the six countries studied with respect to government treatment of foreign investment in the minerals sector. As indicated in the table, Australia, Canada, Fiji, and Colombia have governments that presently meet the average or above test in treatment of TNC investments in the minerals sector. This ranking is based on a subjective evaluation of comments by both government and industry representatives with greater weight being given to the views of industry.

II. COUNTRY ECONOMIC RISK

For the purposes of this report, country economic risk is defined as risk to investments associated with changing economic conditions that result in increased intervention in the economy that constrains the ability of a TNC to achieve its profit objectives. Major concerns are the financial soundness of the government (particularly its debt position) and the economic

TABLE 2
GOVERNMENT TREATMENT OF FOREIGN
INVESTMENT IN THE MINERALS SECTOR

Group I—Better-Than-Average-Treatment	
<u>Australia,</u> (Queensland)	Federal government moderately supportive and state government highly supportive of TNC involvement, with an established successful record of attracting major energy-intensive mineral processing industries.
<u>Canada,</u> (British Columbia)	Federal government moderately supportive, and provincial government has an established record of attracting major energy-intensive processing industries. However, the B.C. provincial government is changeable in its attitude towards minerals taxation—with a tendency toward higher taxation levels.
<u>Fiji</u>	Central government strongly supportive of foreign investment but has a limited track record in minerals. Negotiations in 1980 pertaining to a possible \$700 million investment in the commercial development of the Namosi copper deposit failed because the deposit was subeconomic, not because of government attitudes toward the project. Both industry and government confirmed this view. A nodule project would be the largest foreign investment in Fiji, and therefore may be exposed to greater government scrutiny and involvement than other foreign investments.

Group II--Average Treatment

Colombia Agreements take a long time to conclude, however, two major mineral projects (nickel and coal) have been successfully concluded and brought into production in recent years. Companies report that mineral agreements are reasonably stable.

Group III--Below Average

Ecuador Recent changes in government have resulted in a positive shift in attitude toward foreign investments by the present government, and Ecuador may evolve to Group II in the coming years. However, past negative attitudes and treatment of foreign investors suggest caution.

Philippines Government encourages foreign companies to take a minority equity position in the minerals sector which is dominated by Philippine companies. However, mining industry experts suggest caution for two reasons: (1) corruption substantially increases capital costs of major projects, and (2) uncertainty about the political stability of the present and future governments.

performance of the economy. There is a tendency for governments to impose restrictive economic measures on TNCs (such as increased taxes and limits on repatriated profits) when the government encounters serious financial crises. The following three measures are useful published measures of the financial soundness of governments and country economies:

- (1) Euromoney Ranking
- (2) Institutional Investor Ranking
- (3) Country Economic Performance

1. Euromoney Ranking

One measure of success of a government's economic policies and financial structure is the country's credit rating among major lenders. For the past six years one widely reported ranking is by Euromoney. This system ranks countries based on the overall performance of the country in obtaining loans. The three criteria used in the ranking are: (i) ease of access to the Eurocredit and bond markets, (ii) terms of loans, and (iii) the degree of the success of the loan syndication. Table 3 ranks the six countries considered in this study by their percentile rank for the period 1979-84, and provides the average percentile rank for the six-year period (See Appendix II for a ranking of 116 countries for 1984).

Table 3 clearly shows that Australia and Canada have consistently maintained a high rating, followed by Colombia, Philippines, Fiji, and Ecuador. The six-year averages shown in the table smooth out yearly fluctuations in risk rankings and may give a better basis for a longer-term ranking.

TABLE 3
EUROMONEY COUNTRY RISK RANKING^a
(PERCENTILE RANK AMONG ALL COUNTRIES SURVEYED
BY EUROMONEY)

Country	1979	1980	1981	1982	1983	1984	Six year average
Australia	89	99	97	92	93	95	94
Canada	71	91	76	94	95	94	87
Colombia	70	69	67	70	69	62	68
Philippines	56	61	41	67	68	34	55
Fiji	74	n.a.	n.a.	34	35	43	47
Ecuador	39	37	57	28	33	15	35
Number of Countries	66	66	58	117	116	116	

^aSee Appendix II for rankings of 116 countries in 1984.

(Euromoney, 1979 to 1984)

2. Institutional Investor Ranking

A second, possibly more subjective measure of country risk is the Institutional Investor country credit rating. In this rating system, 75 to 100 bankers are asked to rank all countries from 1 to 100. Table 4 ranks five countries considered in this study by their percentile rank for the period 1979-84, and provides the average percentile rank for the six-year period (See Appendix III for a list of 109 countries for 1984). Fiji is not included--probably because of the small size of its economy and its limited use of international commercial loans.

This ranking produces the same ranking as Euromoney for the top three countries for 1984 and for the six-year average. However, Ecuador and the Philippines are reversed, with Ecuador rated above the Philippines. In both series, Colombia is rated substantially below Australia and Canada, and the Philippines and Ecuador are ranked substantially below Colombia.

3. Country Economic Performance

There are numerous possible criteria for measuring a country's economic performance. A useful series has recently been published by Euromoney (1984b) that gives a 10-year series of economic growth measures including: (i) growth in real GDP, (ii) the rate of inflation, (iii) the strength of the country's currency in terms of Special Drawing Rights, (iv) the growth in exports, and (v) the current account balance relative to GDP. These measures of economic performance for the six countries in this study are shown in Table 5, covering the 1974-1984 period.

TABLE 4
 INSTITUTIONAL INVESTORS COUNTRY CREDIT RATING^a
 (PERCENTILE RANK AMONG ALL COUNTRIES
 SURVEYED BY INSTITUTIONAL INVESTORS)

Country	1979	1980	1981	1982	1983	1984	Six year average
Australia	95	95	95	95	94	92	94
Canada	89	91	94	94	91	94	92
Colombia	57	62	65	68	63	61	63
Ecuador	41	47	53	51	34	36	44
Philippines	44	40	39	45	41	31	40
Number of Countries	93	98	104	107	106	109	

^aSee Appendix III for rankings of 109 countries in 1984.

(Institutional Investor, 1979-1984)

TABLE 5
COUNTRY ECONOMIC PERFORMANCE, 1974-1984^a

Overall Percentile Rank	Country	Real GDP Growth	Inflation Rate (Consumer Prices)	Exchange Rate in terms of SDRs	Export Growth	Current Account Performance
68	Fiji	56	75	72	68	29
61	Canada	35	73	69	75	76
59	Philippines	76	49	28	51	59
56	Australia	43	63	66	65	70
41	Ecuador	72	30	23	35	66
28	Colombia	67	16	22	25	75

^aSee Appendix IV for rankings of 93 countries.

Euromoney, 1984b

In addition, Euromoney has prepared an overall index of economic performance that attempts to combine the five economic performance measures (Appendix IV gives a complete list of 93 countries).

With respect to the overall economic performance of the six countries in this study, Fiji leads the list followed by Canada, Philippines, Australia, Ecuador, and Colombia. It should be noted that the combination of economic measures used by the Colombian government to control inflation, and increased export potential resulting from the large coal and nickel developments, may significantly improve Colombia's economic performance over the next few years.

III. POLITICAL RISK

Political risk is defined as the "probability that political events and conditions will have an impact on international business operations and profits" (O'Leary and Coplin, 1981). Both "political instability" and "government restrictions" are two major subcategories of political risk. Government restrictions are covered in the previous section on government treatment of foreign investments. In this section political risk is restricted to "political instability which encompasses various combinations of significant change in regime or significant levels of politically inspired violence" (O'Leary and Coplin, 1981).

The 1981 Country Risk study by O'Leary and Coplin ranks thirty countries based on their degree of political risk (see

Appendix V). Three of the six countries covered in the present study are evaluated in the O'Leary and Coplin (1981) study. These three countries in order (starting with the lowest political risk) are Canada (No. 1 out of 30 countries), Colombia (No. 13) and the Philippines (No. 23). In Table 6 the relative ranking of all six countries with respect to political risk is shown based on a subjective assessment of the information collected in the country visits and the O'Leary and Coplin (1981) study.

IV. PROJECT RISK

This section focuses on the basic financial and physical parameters associated with the siting of a nodule processing plant. The following six main parameters are summarized:

- (1) Capital costs
- (2) Transportation costs
- (3) Energy costs
- (4) Labor costs
- (5) Tax levels
- (6) Port suitability
- (7) Operating cost summary

The complete evaluation of any site for nodule processing will require a full feasibility study. Even a prefeasibility study can cost millions of dollars, and will include a detailed cash flow analysis normally along with sensitivity analyses of changes in all major financial variables.

TABLE 6
POLITICAL RISK RANKING

Country (Risk level)	Comments
Australia and Canada (Low)	Periodic conflicts in both governments pertain to the rate and terms for mineral resource developments. At the state/province level, Queensland, Australia is less politically volatile toward mineral resource developments than British Columbia.
Fiji (Low-Medium)	Main problem pertains to the ongoing need to develop stronger trust between the two main population groups--Indian and Melanesian origin. Appears to be among the most stable of the Pacific Island nations.
Colombia (Medium)	Significant guerrilla activity exists along with a well-established major drug trade. Serious political unrest has occurred periodically in the past. At present, the government's effort to control the drug trade is producing drug trade related violence that might be detrimental to U.S. investment interests--at least in the short term.
Ecuador (Medium)	A military dictatorship existed for most of the 1970s. Present democratic government is struggling with the need to institute sound economic policies that are unlikely to be popular in the short term.
Philippines (High)	An increasing tide of political violence against the present one-man dominated regime, whose popularity is falling, suggests future political instability.

The key profitability criteria used by most TNCs is whether an investment is likely to meet their minimum internal rate of return (IRR). The minimum IRR on total invested funds in constant dollars usually falls in the 10-15 percent range for minerals projects in stable developed countries. In stable developing countries, TNCs require an IRR of about 14-20 percent. Therefore, to attract a nodule processing plant to a developing country site, the overall economics will need to be significantly better than sites in Australia, Canada, or the U.S.

However, the intention of this study was not to undertake a detailed financial analysis of alternative nodule processing sites, but to attempt to provide an indication of how the various major economic and physical parameters might compare in the longer term (i.e., 10-20 years). Therefore, an attempt was made to discount short-term influences on costs and consider the more fundamental factors that are expected to dictate costs over the longer term. To facilitate comparisons, countries have been ranked for each of the cost elements listed above.

There are a number of different processing options that have been investigated for manganese nodules. A useful summary of these processes is contained in a 1984 study for NOAA prepared by Arthur D. Little, titled, "Technical and Cost Analysis of Manganese Nodule Processing Techniques and Their Significant Variations." In addition, a major five-volume study, "Nodule Processing Site Considerations", was prepared by Bechtel in 1980-1982 for Ocean Mining Associates (OMA). The five confidential OMA studies covering Australia, Colombia, Costa

Rica, Hawaii, and Mexico were made available to the author by OMA on the condition that detailed cost elements for their three-metal pyrometallurgical/hydrometallurgical refinery are not made public. Therefore, the physical quantity estimates used in the Arthur D. Little report for a roughly similar size four-metal pyrometallurgical plant were used in the present study (See Appendix VI for a brief description). As shown below there are at least five processes "that have either undergone significant bench-scale and pilot-work or are based on a process currently in operation." (A.D. Little, 1984).

- (1) Reduction Ammonia Leach Process
- (2) Cuprion Process
- (3) Pyrometallurgical Process
- (4) Hydrometallurgical Acid Leach Process
- (5) Sulfuric Acid Leach Process

The cost estimates summarized in this section are based on the basic plant parameters included in the A.D. Little (1984) manganese nodule processing study, and modified by the cost information obtained from field visits to the six Pacific countries included in this study.

1. Capital Costs

The Bechtel (1980-1982) studies for OMA of the total capital costs for a nodule processing plant in Australia, Colombia, Costa Rica, Mexico, and Hawaii indicate a maximum variation between the lowest and highest cost sites of less than 20 percent.

Therefore, for the purposes of the present study it was assumed that the total variation in capital costs among the six countries studied will also be less than 20 percent. The sites in Australia and Canada will require much less infrastructure, however, these countries have the highest cost of labor. If there is a significant capital cost differential, it is more likely to be in favor of Australia and Canada which already have fully developed ports at the potential nodule sites.

The total capital cost of the four-metal pyrometallurgical plant in the A.D. Little (1984) study is \$1.1 billion (1984 dollars), excluding the mining and ocean shipping elements. This is for a plant with a capacity of 3 million dry tonnes nodules per year. Assuming a minimum internal rate of return of 14 percent in constant dollars, the average annual cash flow to the investor will be in the range of \$200 to \$240 million for an investment of \$1.1 billion.

2. Transportation Costs for Nodules

About 4 million tonnes of wet nodules will be shipped from a hypothetical nodule mine site in the rich Clarion-Clipperton manganese nodule area as shown in Figure 2. Table 7 gives a summary of the costs of shipping nodules to the six countries studied. Canada (Prince Rupert) is the closest site (approximately 4,400 km from the mine site) and the Philippines is the most distant (approximately 12,000 km). The transport cost differential between Canada and the Philippines is about \$22 million per year.

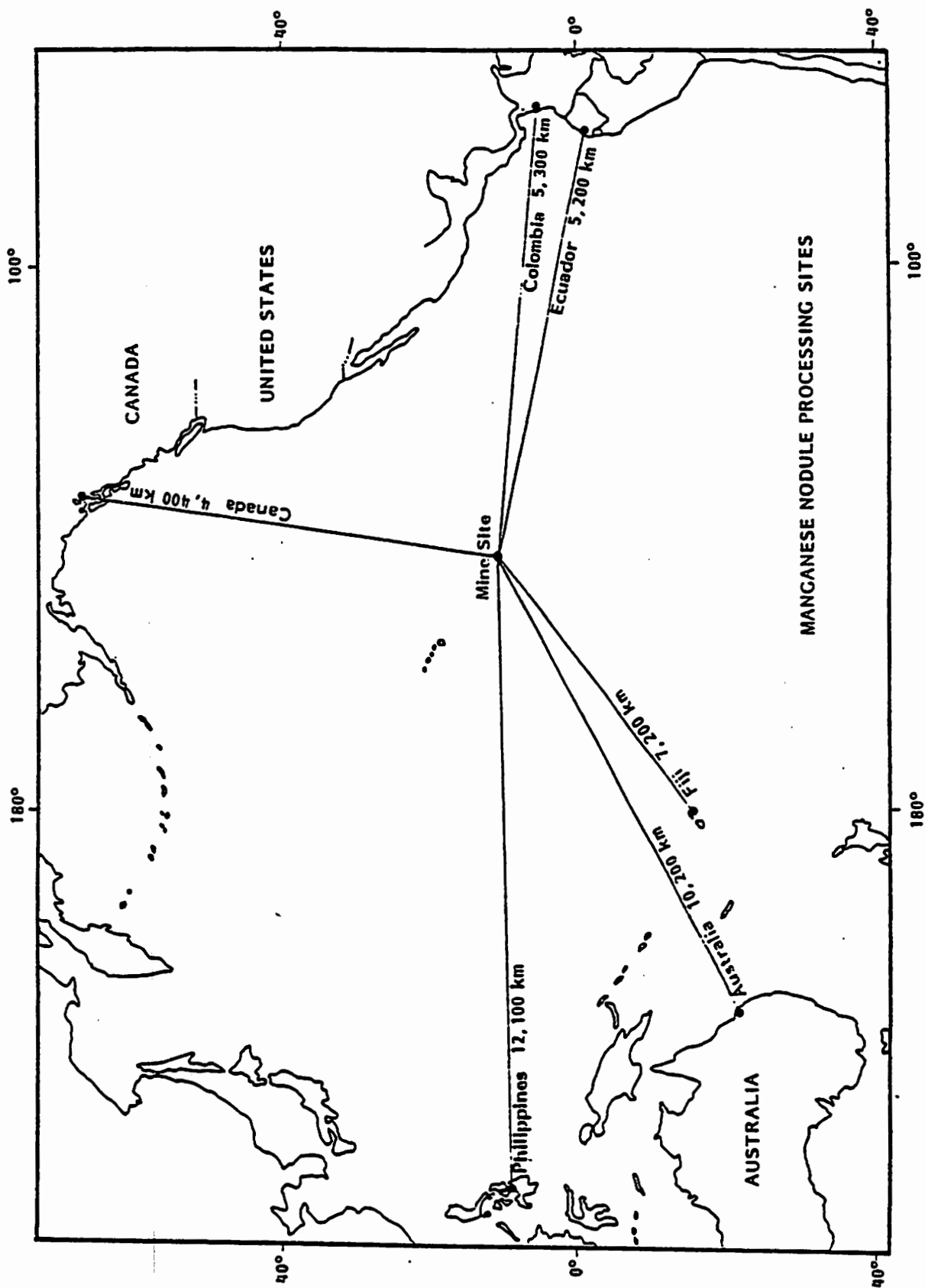


Figure 2. Manganese Nodule Processing Sites

TABLE 7
NODULE SHIPPING COSTS
(3.9 MILLION TONNES, WET)

Mine Site to	km	\$/tonne ^a	Total Million \$
Canada	4375	7.14	27.9
Ecuador	5165	7.73	30.1
Colombia	5260	7.80	30.4
Fiji	7195	9.23	36.0
Australia	10,175	11.44	44.6
Philippines	12,125	12.88	50.2

^aIncludes \$2.50/tonne unloading charge, 1984 \$; ship size assumed at 100,000 dwt; smaller ships would substantially increase transport costs.

3. Energy Costs

For the pyrometallurgical plant assumed in this study, total energy costs represent 50-60 percent of operating costs of the processing plant, including the cost of nodule ore shipping. Steaming coal and coke account for 50-60 percent of total energy costs, with electricity accounting for 30 to almost 50 percent of total energy costs. The cost of energy with respect to a pyrometallurgical nodule processing plant is the most critical operating cost element in plant site selection. In particular, the availability of low-cost electricity is a key factor in site selection.

(i) Coal. Three sources of steaming coal were examined with respect to FOB and CIF costs. Table 8 shows the lowest-cost coal option for each plant site. Australian coal at \$42/tonne CIF at an Australian nodule processing plant is the lowest-cost option, followed by Canada, Colombia, Ecuador, Fiji, and the Philippines. The costs in the table are estimates of long-term minimum costs in constant 1984 dollars. U.S. steaming coal is not likely to be the lowest-cost coal option for any of the sites examined, and therefore was not included. By the 1990s, Indonesia may be an important exporter of steaming coal which would particularly benefit the Philippines site. At present, the price and availability of Indonesian steaming coal is too speculative to include in this study.

(ii) Electricity accounts for between about \$40 million and \$120 million in annual operating costs and is the most variable element among the operating cost categories examined. Table 9

TABLE 8
COAL COSTS
(1984 DOLLARS)

Hypothetical Nodule Processing Site	Source of Coal	Rail ¹ km	\$/tonne	Coal FOB Port \$/tonne	Ocean ² km	\$/tonne	Total Cost CIF Processing Site (\$/tonne)
Australia (Gladstone)	Australia, Queensland	200	8.50	42	0	0	42.00
Canada (Prince Rupert)	Canada, NE B.C	1000	19.50	46	0	0	46.00
Colombia (Salano)	Colombia, El Cerrejon	150	5.50	42	1465	5.50	47.50
Ecuador	Colombia, El Cerrejon	150	5.50	42	2060	6.00	48.00
Fiji (Savu Savu)	Australia, Queensland	200	8.50	42	3060	6.00	48.00
Philippines	Australia, Queensland	200	8.50	42	5000	7.50	49.50

¹Rail: Australia 3.0 cents/tonne/km, Canada 1.7 cents/tonne/km, Colombia 2.0 cents/tonne/km, plus \$2.50/tonne handling at port.

²Ocean: Including \$2.50/tonne unloading charge; ships are 100,000 dwt except Colombian coal limited to 80,000 dwt by the Panama Canal (see Appendix VII).

TABLE 9
ELECTRICITY COSTS^a

Country	cents/kwh	Plant
Canada	2.2	Hydro
Australia	2.7	Coal
Colombia	3.5	Hydro
Ecuador	3.8	Hydro
Philippines	6.2	Coal
Fiji	6.6	Coal

^aEstimated long-term price in 1984 terms

shows the estimated long-term price of electricity in constant 1984 terms at each plant site. The estimates for Australia and Canada were confirmed by more than one reliable source. The estimate for Colombia is probably within ± 10 percent. The estimates for Ecuador, Fiji and the Philippines are less reliable. At present, electricity in Fiji is above 10 cents/kwh. However, a new base-loaded plant fueled by imported steaming coal from Australia should be able to supply electricity in the 6-7 cents/kwh range.

4. Labor Costs

Reliable statistics on labor costs in the minerals industry are difficult to determine because, even within developed countries such as Australia and Canada, there are substantial differences in what is included in labor costs. Figure 3 shows the estimated average per hour salaries in each country. The Canadian and Australian figures are mining industry averages including benefits, and are more than six times as high as Fiji, Ecuador, Colombia, and the Philippines. The Philippines has the lowest labor costs at substantially less than \$1 per hour. Fiji, Ecuador, and Colombia have average labor costs in manufacturing in the \$1-\$2 per hour range and Australia and Canada have a mining industry average salary of \$14-\$16 per hour range. With respect to longer-term wages that might apply in a nodule processing plant, labor wages in the \$2-\$4 per hour range in constant 1984 dollars are believed to be realistic for Fiji, Ecuador, and Colombia. The Philippines is expected to continue

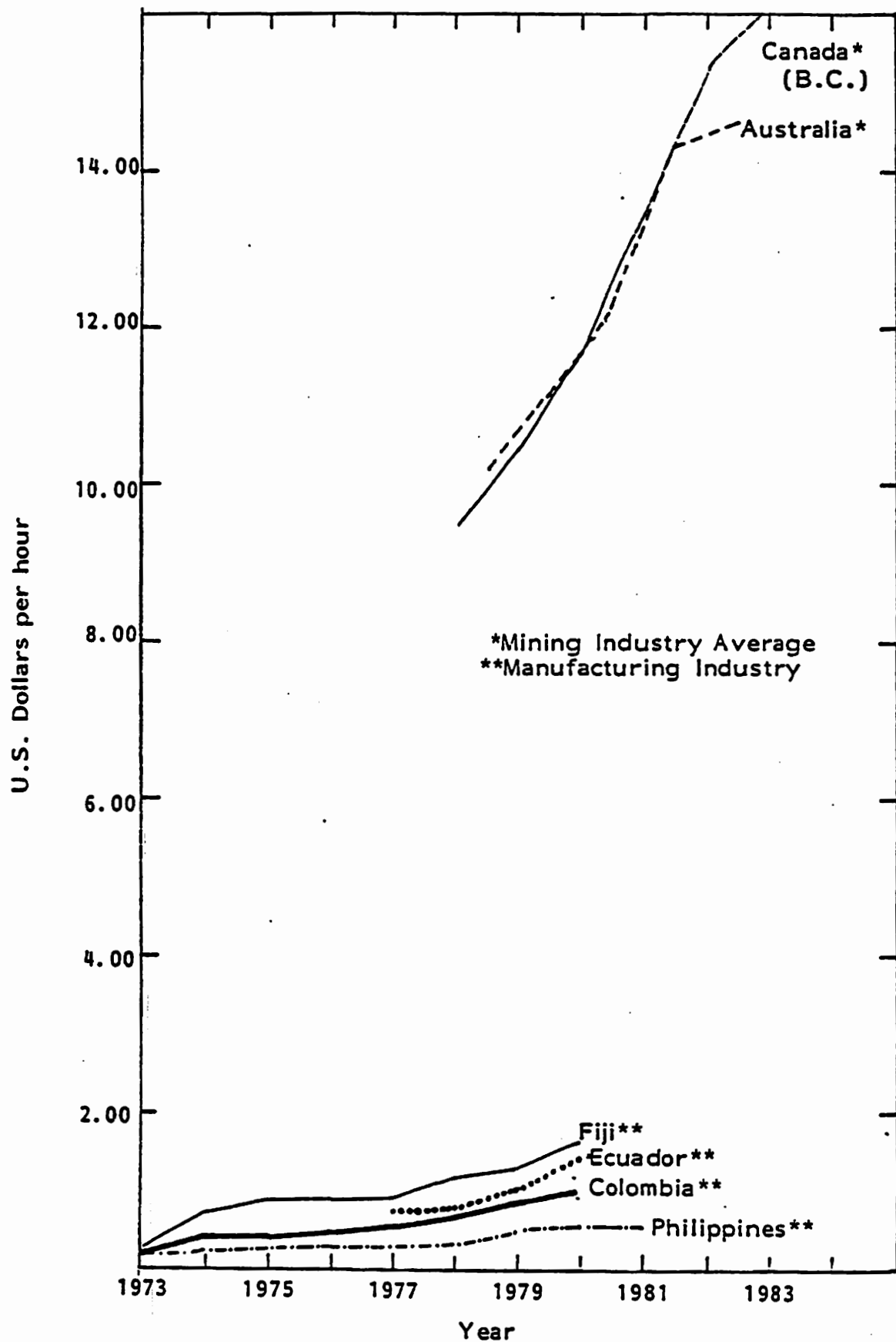


Figure 3. Trends in Wages

Sources: Price Waterhouse, 1983; Coopers and Lybrand, 1981, 1982, 1983; International Labor Organization, 1983; United Nations, 1981; Phoenix Associates, 1984.

to have the lowest labor costs at less than \$2.00 per hour in constant 1984 dollars. Table 10 shows the estimated costs of employment for a manganese nodule processing plant.

5. Tax Levels

With the exception of Australia and Canada, the overall effective tax rate is likely to be the result of negotiations, and the government's level of interest in attracting the investment. Therefore, a simple comparison of published tax rates is probably misleading. Moreover, the quantitative implications of the tax provisions in the various countries are impossible to evaluate without completing a cash flow analysis for the project for each country.

The approach used here was to present the main tax elements in existing legislation, followed by a subjective estimate of the likely relative tax levels that would apply to a nodule processing plant. Table 11 shows a summary of the main tax elements and levels in each country. As shown in Table 11, Fiji is expected to have the lowest overall tax rate for a nodule processing plant, and Australia is expected to have the highest tax rate.

6. Port Suitability

For each of the six countries studied a port site was selected which was believed to either be the best port site in the country or comparable to the best site available for nodule processing. The following factors were considered in selecting each site:

TABLE 10
EMPLOYMENT COSTS
(CONSTANT 1984 DOLLARS)

Country	Number of Employees ^a	Average per Employee all Categories ^b	Annual Cost (million dollars)
Canada	740	36,800	27.2
Australia	740	31,234	23.1
Fiji	890	12,437	11.1
Colombia	890	11,383	10.1
Ecuador	890	11,383	10.1
Philippines	890	7,714	6.9

^aAssume 20 percent more labor in developing countries. Note: some authors estimate employment levels of about double the estimates shown in this table for pyrometallurgical plants.

^bAssumes only small numbers of highly paid expatriates will work in the processing plant (maximum of 5 percent).

TABLE 11
SUMMARY OF MAJOR TAXES LIKELY TO BE
APPLICABLE FOR A NODULE PROCESSING PLANT^a

	Australia	Canada, B.C.	Colombia	Ecuador	Fiji	Philippines
Taxes Negotiable	No	No	Yes	Yes	Yes	Yes
Main Taxes						
Federal Income Tax	46-51%	36% ^b	40%	40%: 0.4 ROR	22.5%	35%
State/ Province Tax	minimal	16%	minimal	minimal	minimal	minimal
Withholding on Dividends	15%	15%	20%	20%	none	10%
Other Important Taxes	—	mining tax 17 1/2%	-	15% to employees	—	10% corp. devel tax
Main Deductions						
Interest	Yes	Yes	Yes	Yes	unknown	Yes
Depreciation	10%/ year; may qualify for 33 1/3%	30% declining balance	up to 60%	10% straight line	30% 1st year, then 7% straight line	negotiable
Loss Carry- Over	Yes	Yes	Yes	Yes	Yes	No
Tax Holiday	No	No	unknown	unknown	Yes	Yes, excluding Inc. Tax

Investment/ Export Credit	minimal	7-20% tax reduction	5-12% export credit	nego- tiable	nego- tiable	export credit, max 100%
Relative Total Tax Rate ^a	high	medium	medium- low	medium	low	medium- low

^aNote: methods of tax calculation and interpretation of provisions are difficult without country tax experts, plus tax provisions are far more complicated than shown here. The above table is useful only as a general indication of the main taxes and levels.

^bResource allowance can reduce federal income tax to 27%; plus there is a processing allowance of 8-25% of operating costs.

^cEstimated relative tax levels for a nodule processing plant: high $\approx$ 40+%, medium $\approx$ 30-39%; low $\approx$ under 30%.

1. Port facilities: Depth of water and degree of development of the port to accommodate ships in the 100,000 dwt class. This size ship is most advantageous for the more distant nodule sites (Australia and the Philippines). Appendix VII gives a rough approximation of the transport costs for a range of ship sizes.
2. Land: Availability of sufficient land for the plant and waste disposal (approximately 200 hectares for plant and 300 hectares for disposal of primarily solid slag).
3. Water/power: Access to sufficient water and electrical power (minimum of 3 billion gallons per year and 1,800 million kwh of electricity--about 275 MW of installed capacity). May substitute seawater for a portion of the water requirements.
4. Other infrastructure: Towns, roads, etc.

Table 12 shows a summary and ranking of the port sites examined. Australia has the best site examined, followed closely by Canada. Two possible sites were located in the Philippines, and the Philippines appears to have the third best site followed by Colombia. The Colombian site has been examined and is judged to be quite feasible by Colombian engineering consultants (Mejia, 1984). The Fiji port site could be developed but probably not to the standards of the Australian and Canadian sites. Information on suitable sites in Ecuador and the Philippines is quite sketchy.

7. Operating Cost Summary

Table 13 contains a summary of the estimated operating costs for a pyrometallurgical processing plant. Nodule ore transportation costs are included because they vary between sites, however, nodule mining costs are independent of nodule site considerations and are excluded. In addition, transportation of metal products to markets have been excluded, along with taxes and a return on capital. The table shows Australia, Canada, Colombia, and Ecuador as having total operating costs within 5 percent. Therefore, these four sites cannot be readily differentiated based on the rough estimates of operating costs. Both Fiji and the Philippines are shown as having significantly higher operating costs than the first four countries. As operating costs do not include the major elements of a return on capital and taxes, which may vary by perhaps \$40-\$70 million between sites, it is not possible to determine

TABLE 12
PORT SITE SUITABILITY

Physical	Australia Gladstone	Canada	Philippines	Ecuador	Fiji	Colombia
Port facilities	A	A	B-C	C-D	C	C
Land	A	B	B-C	B-C	C	B-C
Electricity	A	A	C	C-D	C-D	C
Water	B	A-B	C	B-C	C-D	B-C
Other Infrastructure	A	A	B-C	B-C	C	C

Rating: A: highest standard already exists with no major investments
 B: moderate investment needed to meet requirements
 C: major investments needed to meet requirements
 D: major investments needed but may not achieve standards of A, B,
 and C

TABLE 13
OPERATING COSTS OF A PYROMETALLURGICAL
NODULE PROCESSING PLANT^a
(1984 DOLLARS)

	Australia Million \$/year	Canada Million \$/year	Colombia Million \$/year	Ecuador Million \$/year	Fiji Million \$/year	Philippines Million \$/year
Ore Transport	44.6	27.9	30.4	30.1	36.0	50.2
Plant						
Energy—Coal	43.6	47.8	49.3	49.9	49.9	51.4
Coke	64.0	64.0	64.0	64.0	64.0	64.0
Oil	12.1	12.1	12.1	12.1	12.1	12.1
Elec	48.4	39.5	62.8	68.1	118.3	111.2
Nonfuel	70.4	70.4	70.4	70.4	70.4	70.4
Water	1.5	1.5	1.5	1.5	1.5	1.5
Labor	23.1	27.2	10.1	10.1	11.1	6.9
Maintenance	25.0	25.0	25.0	25.0	25.0	25.0
	332.7	315.4	325.6	331.2	388.3	392.7

^a3.9 million wet tonnes/yr; includes ore transport to plant; excludes mining costs and metal product transport costs to market.

(See Appendix VIII a-f)

with a high degree of certainty which of the four lowest-cost countries (Australia, Canada, Colombia, and Ecuador) would be the best financial investment without performing a complete financial analysis for all six sites.

V. OVERALL RATING OF SIX SITES

Table 14 summarizes the ratings for the six sites examined. Australia and Canada are so close in their overall ranking that a feasibility study would be required to decide between the two, even though Canada appears to have a slight overall advantage. Colombia is clearly the third-ranked country, followed by Fiji and Ecuador. The Philippines is ranked as the least favorable site. This study is intended to provide a framework for recognizing important variables that will affect the economic and business climate of various countries. The ratings given in this report are useful in identifying the problem areas. These problem areas can then receive more attention in subsequent feasibility investigations. From the perspective of the governments included in this study, these rankings are also useful in indicating the problem areas that will influence investments in energy-intensive industries in their countries.

TABLE 14
OVERALL COMPARATIVE INVESTMENT
CLIMATE RATING

	Australia	Canada	Colombia	Ecuador	Fiji	Philippines
Investment Attitudes of Government	E	G	G	F-G	G-E	F-G
Political Stability	E	G+	F-G	F-G	G	P
Economic & Credit Rating	E	E	G	F	G	F
Energy Costs	G+	E	G+	G	P	P
Labor Costs	P	P	G	G	G	E
Transport Costs	F	E	G	G	G	P
Port Suitability	E	E-	G	F-G	F-G	G

Ratings: E: excellent, G : good, F : fair, P : poor.

Note: Comparisons are most useful in indicating relative rankings for individual categories across the six countries.

AUSTRALIA

I. COUNTRY POLICIES

1. Policies Toward Mining and Processing

Australia has a long history of encouraging foreign investment in the minerals sector. This is reflected in the relatively high levels of foreign investment over most of the past quarter century (as previously shown in Figure 1).

Australian mineral policies are divided between the federal and state governments. To date, the focus of the federal government has been on the issues of the terms for foreign investments, federal taxation, tax incentives, and to ensure that mineral commodities are exported at their full market value.

Between the late 1940s and 1972, both state and federal governments followed a policy that mineral developments were for their "...own sake, and had not been concerned about whether the source of development capital was local or foreign." (Bambrick, 1979).

By the early 1970s there was growing public concern that Australia was not receiving sufficient benefits from the development of its mineral resources. In 1972, the Liberal-Country Party (conservative) lost to the Australian Labor Party (liberal). The Australian Labor Party took a hard line on foreign investment, including such measures as a minimum 50 percent Australian equity requirement in new projects, a removal of some tax concessions, and a generally negative attitude toward foreign investment. Foreign investment in the minerals sector decreased dramatically in response to the changed attitudes of

the Australian government. In December 1975 the more pro-business Liberal Party returned to power. Although a number of the changes implemented by the Labor Party have been retained, the general positive attitude toward foreign investment has been maintained since 1976. The 50 percent Australian equity requirement is now considered a goal rather than an absolute requirement.

Both industry and government representatives indicated in mid-1984 that they believed Australia was a safe place in which to invest in the long term.

In early 1983, the Australian Labor Party returned to power and has followed a more moderate course than during its previous term in the early 1970s. The government has instituted a review of the minerals industry and is making changes that appear to reflect longer-term trends in Australia. In late 1983, Senator Peter Walsh, the Minister for Resources and Energy, stated: "The Government's policies in the minerals and energy field are designed to encourage the development of Australia's mineral and energy resources in ways which recognise the legitimate interests of developers, consumers, and the community at large. In this respect the taxation of extractive industries is a key policy area" (Walsh, 1983).

Specifically, the federal government's new focus has been on the establishment of effective taxes that will more heavily tax rich mineral developments but not projects of average profitability. This policy shift resulted in the introduction in July 1984 of a "resource rent tax" for new offshore petroleum

projects (Keating and Walsh, 1984). From a longer-term perspective it appears likely that foreign investment will be welcome providing at least 50 percent of the equity is Australian, and that some form of excess profits tax will apply to the mining projects. It appears unlikely that a nodule processing project would be subject to excess profits tax provisions, but would be subject to general tax legislation applicable to the minerals processing sector.

2. Policies Toward a Manganese Nodule Processing Plant

At both the federal and state levels, governments were positive toward the idea of the establishment of a major manganese nodule processing plant in Queensland, Australia, providing the investment meets the normal requirements for major investments in minerals processing, including environmental constraints. Queensland government and Gladstone port officials were particularly encouraging with respect to such a major investment. However, given the Australian government's support of the Law of the Sea Convention, it is unlikely that the Australian government would approve major developments in countervention of the U.N. Law of the Sea Convention.

II. MINERALS INDUSTRY INVESTMENT EXPERIENCE

1. The Australian Minerals Sector

Most major multinational mining companies in the United States have mineral-related investments in Australia. In 1982-83 there were 130 major mining companies operating in Australia. As

shown in Table 15, in 1982-83 the mining and mineral processing industry in Australia generated a sales revenue of \$9,479 million (Coopers and Lybrand, 1983). Exploration expenditures, which are a measure of companies' long-term views, were \$329 million--these levels are impressive because they were made during a period of low commodity prices and low industry profits. Although not shown in the table, since 1980 capital expenditures by U.S. majority-owned companies and affiliates in the Australian mining industry have been the highest among the six countries studied.

Table 15 shows salient trends for the Australian industry during the past five years--a period of very poor economic performance of the minerals sector throughout the world. The average return on investments in the smelting and refining industry in Australia was 2.1 percent in 1982-83--less than a fifth of the levels reportedly required by investors. This low return is not unique to Australia, but reflects the performance in North America during 1982-83 as well. Average salaries in Australia are comparable to those in North America (albeit slightly less), and much greater than those in any developing country in the Pacific region. Total effective tax levels are relatively high in Australia, owing to a combination of federal and state taxes. States also impose substantial indirect taxes, particularly with respect to rail tariffs on bulk minerals.

2. Industry Views Toward Investment

With the exception of the 1973-1975 period, most TNCs have ranked Australia among the top five most attractive countries in

TABLE 15

TRENDS IN THE AUSTRALIAN MINING INDUSTRY

	1978-79	1979-80	1980-81	1981-82	1982-83
Sales Revenue (million \$)	5947	7840	8732	9159	9479
Total Assets (million \$)	9469	12109	16878	21408	22636
Return on Funds (%)					
Exploration and Mining	13.0	13.6	6.5	2.6	5.2
Return on Funds (%)					
Smelting and Refining	8.6	10.0	8.2	2.9	2.1
Exploration Expenditures (million \$)	169	199	386	502	329
Employees	64973	71106	82330	81083	77815
Average Employee Annual Income (\$)	20790	23207	25646	29903	30731
Taxes as % of Operating Profits*	52.8	53.8	56.3	72.0	65.6

*Resource-based taxes and income taxes as a percentage of operating profits.

Source: Coopers and Lybrand (1981, 1982, and 1983)

the world for investment in the minerals sector. One senior Australian mining industry executive provided the following ranking of the countries in this study with respect to their favorability for investment:

- (1) Australia
- (2) Canada
- (3) Fiji
- (4) Philippines
- (5) Colombia
- (6) Ecuador

The ranking reflects, in part, the company's experience--which has not included South America. A Canadian mining company executive, whose company is presently involved in a major investment in Australia, reported that "Australia has more intense feelings than Canada, but they have no problem in investing in either country." However, the majority of the people in industry interviewed indicated more intense government feelings in British Columbia than in Queensland.

In a recent study of overall country risk with respect to the minerals sector in thirty two countries, Australia was ranked third behind Canada (2nd) and the United States (1st) (Appendix IX) (Hargreaves and Fromson, 1983).

III. ECONOMIC ENVIRONMENT

1. Labor Costs

Australia's labor costs are almost as high as Canada's and far above those in the four developing countries included in this

study. As shown in Table 15 the average industry labor cost in 1982-83 was \$30,731 per year. Australian trade union membership accounts for about 60 percent of the employed wage and salary earners, making Australia one of the most highly unionized nations in the world. Labor works a 38 hour week in Australia and normally has four weeks paid annual vacation.

The Australian mining industry is known for its labor strikes. The average of all Australian industries was a loss of 0.3 days per worker as a result of strikes in 1982-83. In the minerals industry 2.9 days were lost per employee which was down from 9.6 days in 1981-82 (Coopers and Lybrand, 1983). It can be assumed that the incidence of strikes in Australia will remain significantly above the levels in the U.S. in the longer term.

Australia has skilled personnel at all levels and the entire employment requirements for a nodule processing plant could, in effect, be obtained within Australia.

2. Energy Costs

Australia has extensive high quality coal reserves that have been the key to the rapid development of energy-intensive processing industries in Australia. Within the Pacific Basin, Australian coal is probably the lowest cost on a per ton basis. These coal reserves are located in Queensland, Australia as shown in Figure 4. Both industry and government officials indicated unofficially that large blocks of electricity can be obtained in the future in Queensland for about 2.7¢/kwh. This electricity price is in agreement with a Bechtel Study (1982) for Ocean Mining Associates concerning electricity for a nodule processing

site located at Gladstone, Queensland. Appendix X shows a comparison of electricity charges for large industrial consumers in a number of countries. These comparisons are useful as a general guide, however they do not necessarily reflect the cost of future supplies. It should be noted that as Australian electricity is based on coal-fired plants with a higher operating cost to capital cost ratio, Australian electricity may be subject to higher long-term rates of escalation than hydroelectric-based electricity in Canada and Colombia.

3. Inflation and Exchange Rates

Australia's average annual rate of inflation of Gross Domestic Product (GDP) averaged 3.1 percent from 1960 to 1970 increasing to an average of 11.4 percent from 1970 to 1982 (World Bank, 1984a). The exchange rate in Australian dollars to one U.S. dollar between 1970 and 1983 devalued by an average of about 1.6 percent per year with devaluations exceeding 10 percent in the early 1980s.

4. Taxation and Incentives

Australian federal income taxes are similar to those in the United States with a company tax rate of 46 percent. There is a 30 percent withholding tax on dividends paid by Australian-resident companies to non-residents, however, the rate is normally reduced to 15 percent (Department of the Treasury, 1982). In addition, state governments impose taxes in the form of a stamp tax on business transactions and a payroll tax,

collect royalties on the value of minerals mined and, in the case of Queensland, charge a high rail tariff that is effectively another form of taxation on the minerals sector.

With respect to a nodule processing plant there probably would not be a royalty tax on the metals derived from nodules since nodules are imported from outside of the state. However, there would be royalties and possibly a high rail tariff on the large tonnages of coal that would be required. Table 16 compares present coal transportation rates among four major coal-exporting countries. As previously noted, the high tariff rates for Australia reflect hidden taxes in the tariff rates.

It is apparent from Table 16 that Australian rail transportation rates are 3-4 times those of competing countries, and this largely offsets the advantage of Australian coals being located much closer to ports. In the longer term, Australian rail rates may be reduced if it becomes necessary to maintain a competitive position with other countries.

5. Physical Environment

The eastern Australian coast has five large, developed ports capable of handling 100,000+ dwt ships as shown in Table 17 and Figure 4. In addition, there are a number of suitable undeveloped port/sites on the Queensland coast.

Gladstone Harbor was chosen as a representative (and possibly best) site for a manganese nodule processing site in Australia. The characteristics of the Gladstone site are summarized below:

TABLE 16
COMPARATIVE RAIL CHARGES FOR COAL
(1983)

Country	cents per tonne/km	Typical Distances to ports (km)
U.S.A. (eastern)	1.6-3.2	300-500
U.S.A. (western) ^a	1.5-2.0	1200-1600
Canada	1.4-1.6	1000
South Africa	1.5	500
Australia (N.S.W.)	2.7-9.0	50-150
Australia (Queensland)	5.4-9.9	150-250

^aEstimate from unpublished coal contracts.

(Kennett, 1984)

TABLE 17
EASTERN AUSTRALIAN COAL PORT CAPACITIES

	Existing Capacity ^a (maximum size ship) (dwt)	Potential Capacities (vessel draft)	Capacities for Coal ^{a,b} (million t per year)
Port Kembla	120,000	16.3	19.5
Newcastle	110,000	16.5	40.0
Brisbane	60,000	13.0	3.0
Gladstone	120,000	15.3	26.0
Hay Point	150,000	>16.5	35.5
Abbot Point	150,000	>16.5	6.0

^aNational Energy Advisory Committee, 1983

^bIncludes expansions in progress.

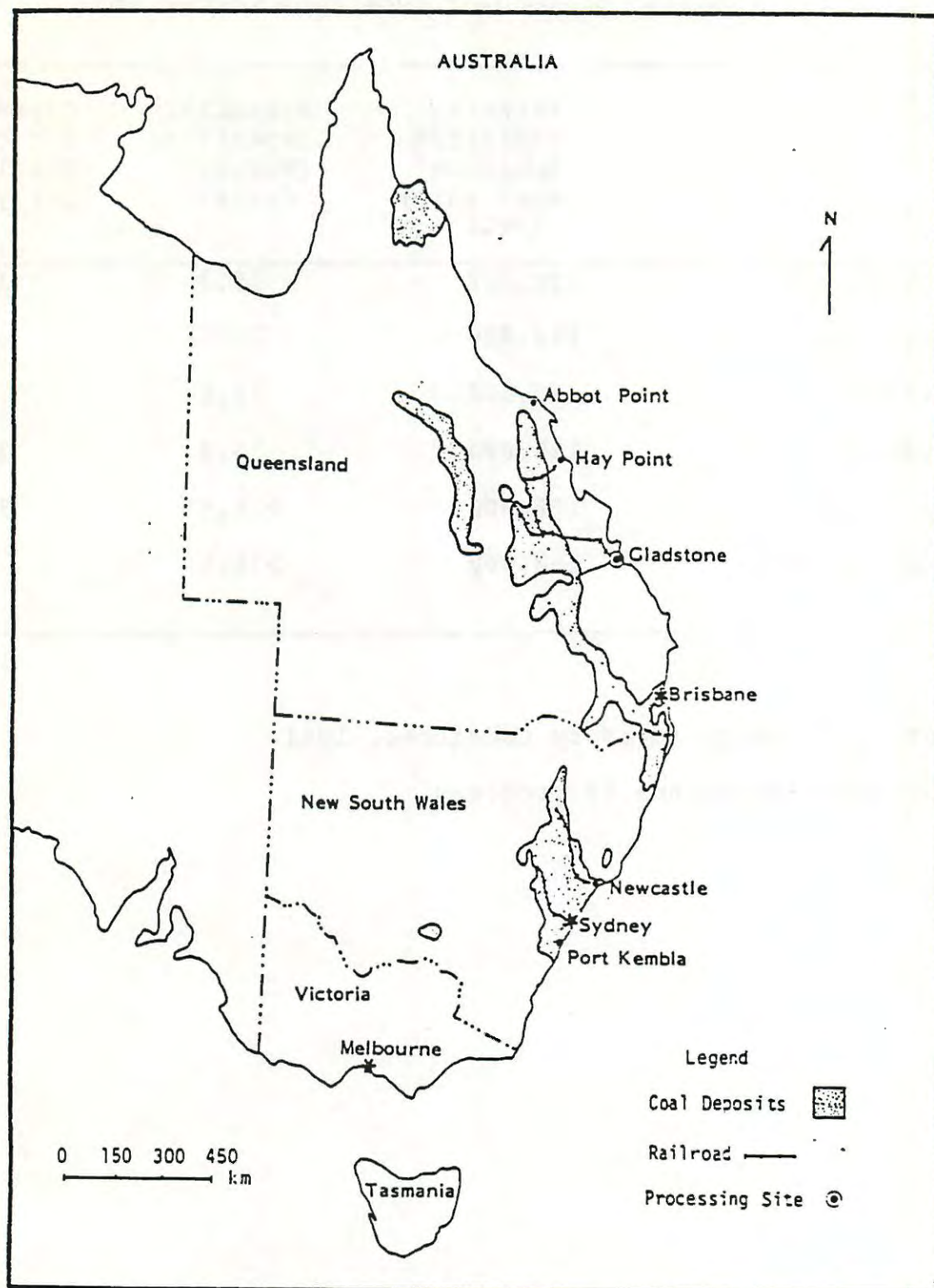


Figure 4. Eastern Australia Showing Major Ports, Possible Nodule Processing Site, and Major Coal Fields

Ship Size: Maximum 120,000 dwt (larger than maximum size required).

Land Availability: Sufficient areas are reserved for future industrial developments.

Disposal Site: An adjacent site is available that could take 80 million tonnes of slag and solid non-toxic wastes.

Infrastructure: a) The largest power station in Queensland with 1,650 MW is located at Gladstone; b) the population of Gladstone is a modest 25,000, and is heavily oriented toward industrial development; c) water: may require investment in additional storage facilities, however, a second dam to hold 38,000 megaliters is under construction; d) the city has an airport connecting to international airports at Brisbane--about one-half hour's flight away.

Industry: a) The world's largest aluminum plant is located at Gladstone (built in 1967 at a cost of about \$400 million); b) a major aluminum smelter costing about \$700 million and producing about 100,000 tonnes aluminum per year began operation in 1982, expanding to about 200,000 tonnes per year in 1984. Although electricity costs for aluminum smelter are not known, rates must be very low (under 2.5 cents/kwh) to attract such an energy-intensive plant.

Gladstone was also selected as a possible site for manganese nodule processing in a study by Bechtel for Ocean Mining Associates (1982). The Queensland State Government is one of the most pro-investment governments anywhere. The state government works actively to ensure that necessary approvals are made on a timely basis.

CANADA

I. COUNTRY POLICIES

1. Policies Toward Mining and Processing

Canada is the world leader in international trade in minerals (excluding petroleum). The total value of minerals production places Canada fourth among all mineral-producing nations. Development of such a large minerals industry has been based on continued large levels of foreign investment--primarily from the United States. Canada receives the largest total amount of foreign investment of any major nation. In 1980, 475 foreign corporations controlled 45 percent (\$26 billion) of the \$58 billion in mining and petroleum assets in Canada (Brennan, 1982).

The high levels of investment indicated above are the result of a combination of factors, including relatively stable policies toward foreign investment, rich natural resources and investment opportunities, and proximity to the United States. Until the early 1970s, Canadian economic policy was dominated by the view that GNP growth was the key policy target. During the 1970s, the view shifted toward a greater concern with "quality" rather than "quantity" of development. This shift in view resulted in such changes as tax reform (higher effective taxes) and stricter environmental requirements (Energy Mines and Resources of Canada, 1981).

The provincial governments of Canada basically control minerals development within each province. With respect to a manganese nodule processing plant, the policies of British Columbia are the key to evaluating the investment climate.

Although British Columbia encourages mineral developments, it has been one of the most aggressive provinces in raising tax levels in the mining industry.

A recent study of various social, political, and economic factors influencing investment in British Columbia concludes (HDD Resource Consultants, 1982):

. . . We expect that government influence in the B.C. mining industry will increase through further regulation, through central planning of resource development, and through equity investment in resource companies. The labour environment is expected to stabilize, with unions growing more conservative. Unemployment is expected to be an important influence, both to government and to union policy. The tax environment is not expected to change radically.

II. MINERALS INDUSTRY INVESTMENT EXPERIENCE

1. The Canadian Minerals Sector

As shown in Table 18, Canada is among the six leading producers of 17 mineral commodities. Most major multinational mining companies in the United States have mineral-related investments in Canada. Among the six nations examined in this study, Canada has both the largest minerals sector with respect to the value of minerals production and the largest share of U.S. industry foreign investments. However, with respect to investments in mining and smelting by U.S. majority-owned foreign affiliates, Australia has exceeded Canada since 1980.

Table 19 summarizes the salient characteristics of the Canadian minerals industry. These figures do not reflect the generally poor economic state of the mining industry both in British Columbia and throughout Canada.

TABLE 18
CANADA'S ROLE AS A MAJOR
PRODUCER OF MINERALS, 1981

Commodity	Rank	Percent of World Production
Nickel	1	22
Zinc	1	18
Asbestos	2	25
Potash	2	24
Sulphur	2	18
Uranium	2	18
Titanium	2	16
Gypsum	2	9
Molybdenum	3	12
Aluminum	3	7
Platinum	3	6
Gold	3	4
Lead	4	10
Copper	4	8
Cadmium	4	7
Silver	5	11
Iron Ore	6	6

(Brennan, 1982)

TABLE 19
CANADIAN MINERALS INDUSTRY

	1979	1980	1981	1982
<u>Canada^a</u>				
Minerals Production (\$M)	22,311	27,304	27,033	26,815
Capital Expenditures (\$M)	2,279	3,394	4,188	n.a.
Exploration Expenditures (\$M)	225	418	522	n.a.
Employment ('000)	115	126	129	n.a.
<u>British Columbia^b</u>				
Minerals Production (\$M)	1,661	1,745	1,539	1,326
Salary w/all Benefits (\$)	21,939	24,630	28,693	32,342
Capital Expenditures (\$M)	275	583	557	557
Exploration Expenditures (\$M)	188	113	190	143
Employment	16,058	18,497	20,240	17,802

^aBrennan, 1982

^bPrice Waterhouse, 1983a

2. Nodule Processing Site Studies in British Columbia

In the late 1970s, the Canadian Department of Energy, Mines and Resources and the Government of British Columbia completed preliminary technical and financial site evaluations for a possible nodule processing plant in four different locations in British Columbia (see Figure 5) (King and Pasho, 1979, Pasho and King, 1980a, 1980b). One site, Smith Island, is located about 15-20 kilometers south of Prince Rupert, the site chosen in the present study. The British Columbia government would probably in principle support the concept of a major nodule processing plant, however, environmental requirements would be stiff and require extensive environmental studies.

3. Industry Views Toward Investment

When compared to other countries of the world, Canada consistently ranks among the top 10 percent with respect to overall favorability for investment in the minerals sector. Two senior mining industry executives provided relative rankings among the six nations considered in this study. The Canadian executive ranked Canada number 1 and Australia number 2. The Australian executive reversed the ranking. These two rankings probably reflect the greater familiarity of each executive with their own country.

Another measure of industry's view towards the investment climate is its planned levels of investment. A 1983 study of the future power requirements of the British Columbia mining and smelting industries to the year 2000 estimated an increase in

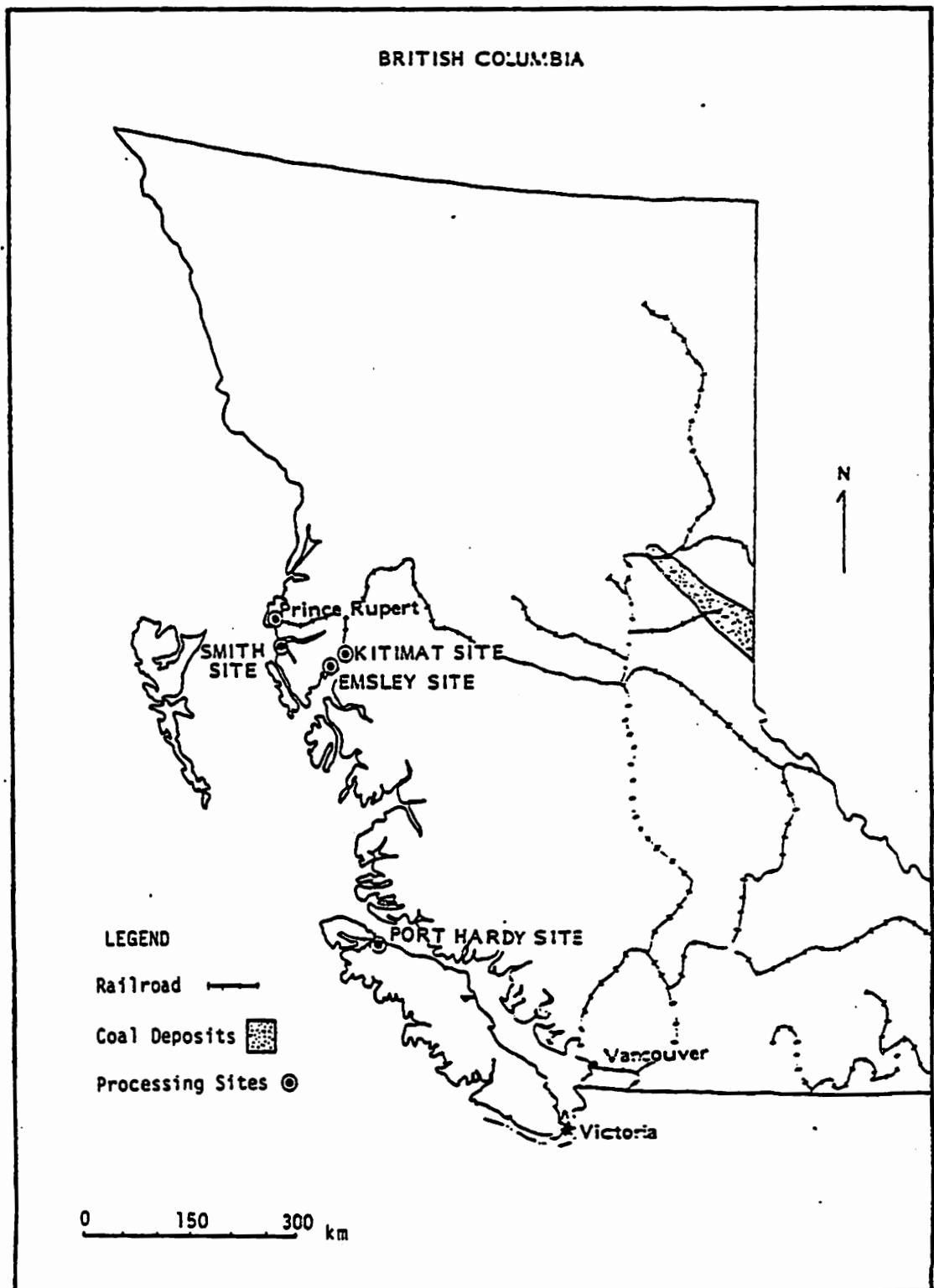


Figure 5. British Columbia, Canada Showing Five Possible Nodule Processing Sites and Major Coal Fields. The Prince Rupert - Smith Island Sites are Discussed in this Study

minerals production value in constant dollars from \$1.5 billion in the early 1980s to \$3.5 billion in the year 2000. This forecast was based on a survey of industry views as well as the consultant's knowledge of the industry in British Columbia (H.N. Halvorson Consultants, 1983a).

As will be discussed later, British Columbia is not without problems from the investor's perspective. The province taxes the mining industry at a relatively high rate and unionized labor is reportedly a problem.

III. ECONOMIC ENVIRONMENT

1. Labor Costs

As shown in Table 20, it is clear that Canada has high labor costs. In the longer term, labor costs (including benefits) in Canada will probably be comparable to the United States and Australia and far above those in the four developing countries considered in this study. British Columbia is almost totally unionized (there is only one non-union mine) (HDD Resource Consultants, 1982), and industry representatives reported that labor problems in British Columbia are difficult--particularly with respect to the construction industry.

2. Energy Costs

British Columbia clearly has a long-term comparative advantage in energy: electricity costs are in the lower 15 percent in the world. There are two categories of industrial electricity users. For large industrial users (there are presently 28 companies in this group) special low electricity costs are available for hydroelectric power.

TABLE 20
AVERAGE ANNUAL MINING INDUSTRY
SALARIES AND BENEFITS
(DOLLARS)

Year	Canada ^a	British Columbia ^b	
		Salary	Total w/Benefits
1975	14,305	--	--
1976	16,396	--	--
1977	16,881	--	--
1978	16,890	16,832	19,637
1979	18,465	18,866	21,940
1980	20,155	21,124	24,630
1981	22,199	24,356	28,693
1982	25,287 ^e	27,721	32,342
1983	26,976 ^e	28,724 ^e	33,512 ^P

^aBrennan, 1982

^bPrice Waterhouse, 1983a

^PPreliminary

^eEstimate

The British Columbia Hydro and Power Authority provided the following "estimate" of approximate electricity rates that might apply to an energy-intensive manganese nodule processing plant (Forrest, 1984):

For new industries locating in British Columbia, and for some existing industrial customers who may be considering expanding their present plants, B.C. Hydro is prepared to provide a discount on B.C. Hydro's standard industrial electricity rate. For electricity supply at a high power factor and load factor, the standard industrial rate is presently about 2.2 cents/kwh.

I understand your proposed plant could require an electricity supply ranging from 400 GW.h/year up to 2,700 GW.h/year. For such a plant, electricity rate discounts of 30-40% on the standard industrial rate could be available until the early 1990s. (This equates to about 1.5 cents/kwh.) Thereafter, a firm supply of electricity would be available at the standard rate, or if compatible with the industrial process, part of the supply could be taken on an interruptible basis at a high discount which would be available for at least another 4 years.

There is presently roughly 3000 MW of spare hydroelectric capacity in British Columbia that will meet the growth in demand for at least the next ten years (Halvorson, 1984).

(i) Coal. A significant factor in the economics of a nodule processing plant is the price of coal. British Columbia is a major coal producer--particularly of coking coal, and for export to Japan. In northeast British Columbia two major mines began operation in 1983 exporting 8-9 million tonnes per year of mostly coking coal through the port of Prince Rupert. Prices for the premium medium-volatile coking coal for one of these mines (Bullmoose) are reported at about \$70/tonne. The price of steaming coal in the region is not known but would have to be

about \$25/tonne cheaper to be competitive in world markets. A recent study of steaming coal prices by the United Nations Economic and Social Commission for Asia and the Pacific (1984) estimates long-term steaming coal prices for Canada at \$45 per tonne. Spot market prices are not considered representative of long-term coal prices, however, they have fluctuated between about \$49 and a low of \$30 tonne at the Roberts Bank export terminal in southern British Columbia in 1983 and 1984. Northeast British Columbia coal mines have relatively high capital costs and long rail transport distances to Prince Rupert. The long-term price of steaming coal in 1984 dollars at Prince Rupert is assumed to be \$46 per tonne.

3. Taxation and Incentives

Today the Canadian mining industry faces a series of taxes that are complicated and result in relatively high levels of total taxes. This is particularly the case in British Columbia. Mining operations are subject to the following three broad categories of taxation:

- (1) A federal income tax of 36 percent of taxable income is generally levied at an effective rate of about 27 percent after provincial tax rebates and a resource allowance.
- (2) A provincial income tax at 16 percent in British Columbia.
- (3) A mining tax and a mineral royalty or a similar mineral resource tax. These taxes probably would not

apply to a manganese nodule processing plant based on imported ore (nodules).

The total British Columbia tax rate as a percent of accounting income is slightly over 40 percent and is the highest in Canada (Price Waterhouse, 1983b). However, the effective overall tax on minerals processing plants is substantially lower due to tax deductions to encourage minerals processing.

4. Physical Environment

Based on industry suggestions, the site selected for the manganese nodule processing plant is the Price Rupert-Smith Island area as shown in Figure 5. Prince Rupert has a deep water port, substantial infrastructure, an established industrial base, available land, and is the export port for Northeast British Columbia coal. It is probable that there will be sufficient water, and a connection can be made to nearby B.C. Hydro for low-cost electricity. The most significant problem may be to find a suitable waste disposal site that meets British Columbia's strict environmental concerns.

The following is a description of the main elements of the physical environment in the Prince Rupert area (CN Rail MOVIN, November 1983, and March 1984):

Ship Size: The existing deep sea terminals are

- a. Ridley Island Coal Terminal: 22 m draft (up to 250,000 dwt ships)
- b. Fairview Terminal: 13.7 m

- c. Grain Elevator: 12.3 m
- d. B.C. Timber Dock: 12 m
- e. Ocean Dock: 9.1 m

In addition, there are other sites in the vicinity that could be dredged to accommodate ships of the size envisioned for a nodule processing plant.

Land Availability: The topography in the area has moderate relief, and much of the area is undeveloped. The following are "rough" estimates based on discussions with Port of Prince Rupert authorities:

		<u>Hectares</u>
a.	Ridley Island: Developed for coal	620
	Undeveloped	2,000
b.	Lelu Island: Undeveloped	1,200
c.	South side of Kaien Island: Undeveloped	3,500

In addition, there is a suitable site 15-20 km south of Prince Rupert on Smith Island that was investigated by the Canadian government as a possible site for a manganese nodule processing plant.

Disposal Site: Because of the moderate topographic relief, the active fishing industry, and high level of sensitivity to air and water pollution in British Columbia, it can be assumed that strict environmental conditions will have to be met with respect to on-land disposal, and disposal into the ocean is probably an unrealistic option. Disposal can be best accommodated for inert slag.

Infrastructure: Prince Rupert is a small town with an economy based mainly on natural resources--forest products, fishing, grain, and coal exports. Prince Rupert is the western terminus of Canadian National Railway's northern rail route, and also the port of export for northeastern British Columbia coal. The town is serviced by a small airport with regular flights from Vancouver.

Industry: Major investments have taken place in the early 1980s to develop the port of Prince Rupert as a major port for export of coal and grain. Approximately \$180 million was invested in a major Ridley Island coal export terminal, and \$225 million on one of the world's largest grain cleaning and export terminals.

COLOMBIA

I. COUNTRY POLICIES

1. Policies Toward Mining and Processing

The view towards foreign investment in the late 1970s was summarized by Price Waterhouse (1978) as follows:

Colombian Government policy toward foreign investment has been traditionally favorable. However, during recent years the trend of this policy has gradually become more restrictive and the formation of regional groups such as the Andean Common Market which implies commitments for joint decisions of member countries on crucial matters, such as the treatment of foreign investment, has contributed to this change in policy. Indications are that foreign capital in Colombia will in future be required to accept a minority position.

The deterioration in the economic performance of the economy since the late 1970s has contributed to a softening in the government's attitudes toward foreign investment. The Commercial Section of the U.S. Embassy reported in September 1984:

To overcome the negative effect that protectionist policies have had on employment, prices and the quality of local products, Colombia is currently involved in a significant effort to promote foreign investment.

With respect to the promotion of foreign investment in the mining sector, the Commercial Section of the U.S. Embassy reports (September 1984):

There is now considerable flexibility for contracting, depending on the nature and characteristics of each project. It is possible to enter into a contract with the Government for services, association, shared production, or any other contract considered convenient.

Representatives from the two major North American mining companies operating in Colombia were interviewed. Their views are probably fairly indicative of the views of foreign investors that have substantial Colombian experience:

Company No. 1: "It takes a long time to do a deal but government sticks to agreements." The government is "fairly honest" relative to developing countries.

Company No. 2: This company has operated in Colombia for a number of decades and believes "Colombia has a good investment climate." The company is continuing to invest in the Colombian minerals sector.

2. Policies Toward a Nodule Processing Plant

Views of both government and industry consultants were generally positive with the exception of one person in the National Department of Planning who listed various concerns including pollution, port site problems, and the lack of infrastructure. It is believed that if a serious effort were made to establish a major nodule processing facility in Colombia it would require a number of years to meet all government concerns, including environmental issues. The government, however, would be supportive of such investment. The government probably would not support investments that were in counterintervention of the UN Law of the Sea Treaty. In both Colombia and Ecuador, it is essential that foreign TNCs have the services of a top national law firm.

II. MINERALS INDUSTRY INVESTMENT EXPERIENCE

1. The Colombian Minerals Sector

Although Colombia has long been a minor contributor to the value of world minerals production, this could change as the nation's large coal resources are developed in the 1980s and 1990s. Colombia is well known as the world's leading producer of high-quality emeralds, however, emeralds do not represent a major share of Colombian commodity exports. Colombia is a modest producer of gold and platinum but the three major mineral operations are petroleum, the newly developed nickel laterite mine and smelter (Cerro Matoso), and a coal mine (El Cerrejon).

Table 21 gives a summary of Colombian minerals production from 1978-1983. Coal production is expected to increase to about 25 million tonnes in 1990 as a result of the development of the massive El Cerrejon coal project. By 1990, coal production is expected to increase in value to about \$850 million and represent perhaps one-third of the value of total minerals production.

2. Foreign Investment in Colombia

Table 22 shows nonpetroleum foreign investments in Colombia according to country of origin for 1980-1983. Investment from the United States represents 50-55 percent of total nonpetroleum investments over this period. The inclusion of petroleum investments would increase the share of total U.S. investments in Colombia.

TABLE 21
COLOMBIAN MINERALS PRODUCTION

	1978	1979	1980	1981	1982	1983	1983 Million \$
	Quantity (Thousands)						
Coal (tonnes)	4,574	4,885	4,947	5,030	5,550	5,580	110
Iron ore (tonnes)	497	397	506	418	470	456	12
Gold (troy oz)	246	269	510	529	473	469	176
Platinum (troy oz)	14	13	14	15	12	10	4
Silver (troy oz)	77	99	152	143	136	99	1
Emeralds							
(carats)	895	1,228	275	299	300 ^e	300 ^e	33
Crude oil							
(barrels)	47,742	45,297	45,629	48,852	51,765	55,531	1,530
Other							64 ^e

Ministry of Mines and Energy (1984); World Bank (1984b).

^eestimate

TABLE 22
FOREIGN INVESTMENT IN COLOMBIA^a
(MILLION DOLLARS)

	1980	1981	1982	1983
United States	574	655	713	764
Switzerland	96	110	115	126
England	36	54	83	94
Panama	69	70	74	80
Venezuela	45	47	50	51
Canada	41	45	46	49
Other (42 countries)	200	220	233	267
Total	1,061	1,201	1,314	1,431

^aBanco de la Republica, 1984 (Central Bank of Colombia). Does not include petroleum, and may not include the total investment in coal, both of which include substantial participation by U.S. companies.

3. Industry Views Toward Investments

As stated in the previous section on policies toward investment, representatives of two major foreign companies already operating in Colombia believe the country has a good investment climate. However, a major Australian mining company, with no investments in Colombia, listed Colombia as fifth among the six countries considered in this study. It may be that once a firm becomes accustomed to operating in Colombia its perceptions of risk associated with its investments tend to decrease. Crime, including significant guerrilla activities in Colombia, combined with the serious associated drug problems probably causes investors to approach Colombia with more caution than would otherwise be the case. Crime at the individual level in major cities, particularly Bogota, is comparatively high.

The following two major investments are important examples of recent foreign-company investments in Colombia's minerals sector.

(i) Nickel. In 1979, Cerro Matoso S. A. was established to develop a high-grade nickel laterite deposit. The three equity participants in this joint venture are the Colombian government (45%), Royal Dutch Shell Group (35%), and Hanna Mining of the U.S. (20%). This mine and smelter required an investment of about \$450 million before beginning commercial production in 1982. A group of international banks led by the Chase Manhattan Bank provided \$120 million in loans, the World Bank provided \$80 million, and the US Export-Import Bank together with commercial banks provided \$25 million. The project is highly energy

intensive and relies on low-cost Colombian hydroelectricity, natural gas, and coal for energy (Cerro Matoso, 1982). During the period when this project was being developed, virtually all other nickel laterite projects in the world were losing money. It required an exceptional level of cooperation between government, the foreign mining firms, and lenders to advance this project to the commercial stage in light of highly depressed world nickel markets. Cerro Matoso may be the only few nickel laterite developmnet in the western world in the first half of the 1980s.

(ii) Coal. The El Cerrerrjon Coal Project is one of the largest coal projects in the world, with a projected total cost of \$3 billion by 1989. The mine is being developed by a joint venture with Intercor (subsidiary of Exxon Corporation of the U.S.) and Carbocol (government-owned company). Each partner shares 50 percent of the investment and operating costs, and receives 50 percent of the coal production. In addition, there is a 15 percent royalty on the FOB mine value of the coal, a 40 percent income tax, and a 20 percent withholding tax on repatriated profits for an effective total tax of between 50 and 60 percent of operating profits. The agreement will extend to the year 2009 when all equity held by the foreign investor will convert to the government. The mine is designed to produce 15 million tonnes per year of steaming coal to be exported primarily to European markets through a deepwater port 150 kilometers to the northeast in the Caribbean (as shown in Figure 6). (World Coal, 1981; Coal Age, 1983; and Mining Journal, 1983).

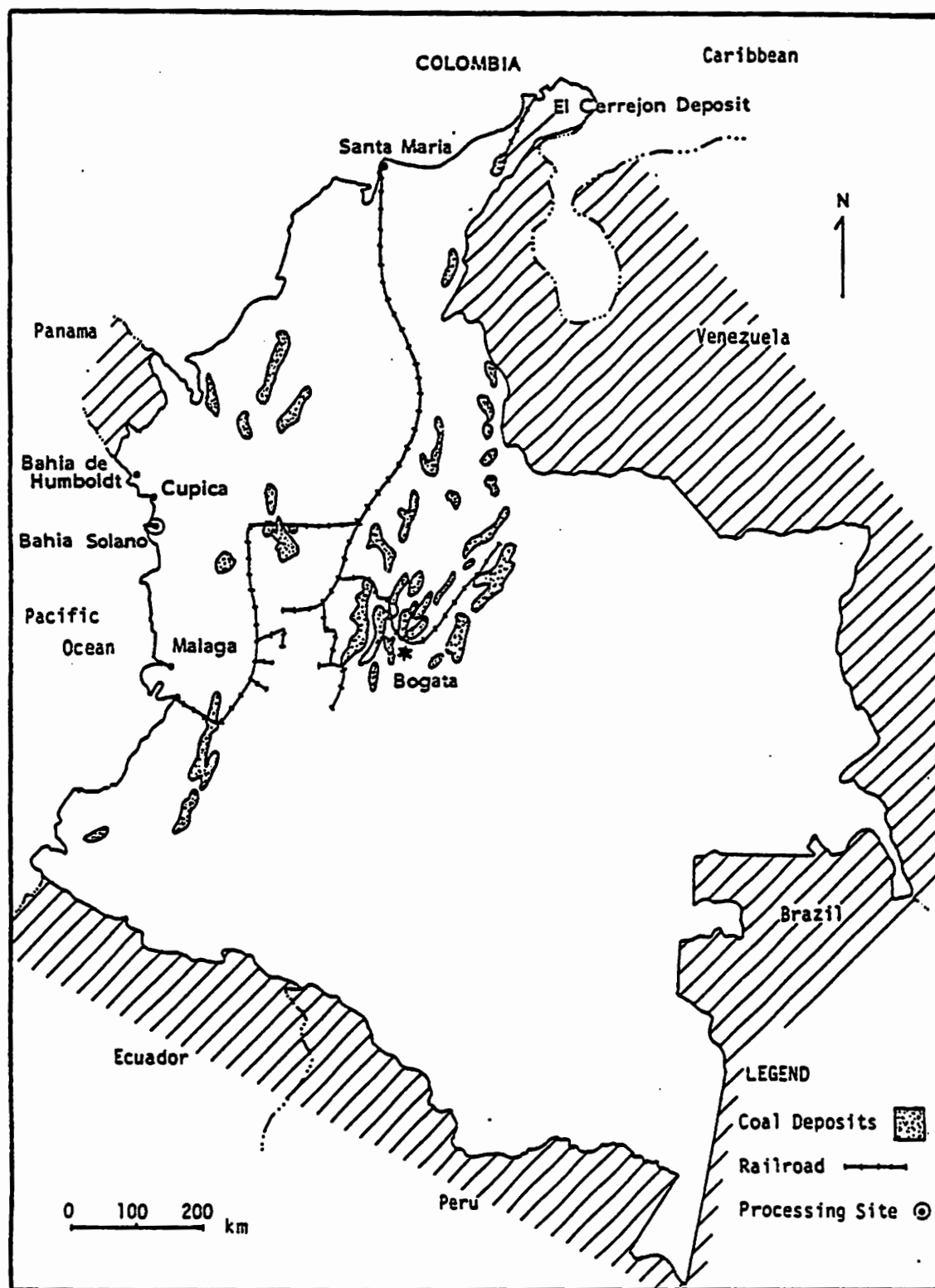


Figure 6. Colombia Showing Possible Nodule Processing Site and the Distribution of Important Coal Deposits

III. ECONOMIC ENVIRONMENT

1. Labor Costs

Figure 3 shows the trend in labor costs for 1973-1983. These figures indicate that wages in Colombia, Ecuador, and Fiji were at roughly the same levels in 1982. With respect to the mining industry, Intercor representatives indicated the following approximate wage levels in 1984 (personal communication, 1984).

Basic mine labor: \$150/mo.

Skilled labor (e.g.,
equipment operators): \$500/mo.

These estimates are only useful as a general guide. For a nodule processing plant, most labor would be skilled, therefore wages in the \$500/mo. range are more realistic for blue-collar workers. In the manufacturing industry the average white-collar worker makes about 2.2 times the salary of blue-collar workers and 5.3 times the average salary of unskilled construction workers in Bogota (World Bank, 1984b).

2. Energy Costs

Colombia has very large, low-cost hydroelectric and coal resources and more modest known petroleum resources. These hydroelectric and coal resources can provide a basis for low-cost energy supplies for energy-intensive industries for many decades.

(i) Electricity. The following estimates were obtained from Integral Ltd, the dominant Colombian engineering firm involved with engineering studies of hydroelectric projects in

Colombia (personal communication, 1984). At present, there is about 3,500 MW of hydroelectric capacity developed in Colombia with a potential of about 90,000 MW of hydroelectric power. Capital costs of much of the hydroelectric potential in Colombia are low compared to most other countries. Expansions during the next decade as shown in Table 23 will have a weighted average capital cost of \$790/kw, a weighted average mean cost of 2.7 cents/kwh and weighted average firm costs of 3.6 cents/kwh.

The San Carlos hydroelectric site is nearest to the selected processing site at Salano. The costs of electricity to this site could be as low as follows:

Costs of generation:	1.8cents/kwh
Transmission to nodule plant:	<u>1.0cents/kwh</u>
	2.8cents/kwh

However, a more conservative estimate of 3.5 cents/kwh has been assumed in the present study (approximately equal to the expected average mean cost of all planned hydroelectric projects plus transmission costs).

(ii) Coal Costs. Colombia has extensive coal resources, however, because of the extreme topography, most coal will be railed to the Caribbean, implying shipment through the Panama Canal to the Salano site in the Pacific. The alternative is to send the coal as a slurry 170 km directly to the nodule plant. The price of the El Cerrejon steaming coal FOB Caribbean port is believed to fall in the \$35-45 per tonne range and will be quite competitive in the European market. A recent estimate of the

TABLE 23
PLANNED HYDROELECTRIC CAPACITY
AND COSTS, 1982-1996

Project	Year	Installed Capacity (MW)	(\$/ kw)	Mean Cost (cents/ kwh)	Firm Cost (cents/ kwh)
Chivor I+II+Desv.	1982	1000	777	2.3	2.6
Paraiso-La Guaca	1984	600	768	3.4	3.8
Salvajina	1984	270	904	3.4	3.6
Guadalupe IV	1985	213	638	1.5	1.6
S. Carlos I+II+ Jag+Cal+Desv	1985	1428	602	1.7	1.8
Betania	1986	500	973	2.9	4.5
Playas	1987	200	1227	2.1	2.4
Guavio	1989	1000	915	2.9	3.3
Rio Grande II	1990	300	710	2.1	2.2
Calima III	1990	240	1184	2.9	3.7
Miel I	1991	384	851	2.6	3.2
Urrá I	1991	340	902	2.4	2.5
Urrá II	1991	860	888	3.7	3.7
Canafisto	1993	1500	849	2.8	4.3
Miel II	1995	351	986	2.3	3.4
Ituango	1996	4270	608	2.5	4.1
Patia I	n.a.	1110	865	3.3	3.9
Patia II	n.a.	970	752	2.6	3.0
Fonce	n.a.	520	881	2.5	4.8
Sagamoso	n.a.	1200	1073	3.7	4.2
San Juan	n.a.	1250	1096	3.0	3.7
Nema	n.a.	512	1038	2.9	3.5
Weighted Average Costs:			790	2.7	3.6

Interconexion Electrica S.A., 1982

Ministerio de Minas y Energia and Departamento Nacional de
Planeacion, 1984

Ministerio de Mines y Energia, 1984.

long-term price of Colombian coal is \$40-45 per tonne (Economic and Social Commission for Asia and the Pacific, 1984). Bechtel (1980) estimates the price of coal from Carbocal (the Colombian government coal company) at \$35 FOB Caribbean port. For the purposes of this study, the long-term price of coal CIF nodule site is assumed to be \$47.50 tonne.

3. Taxation and Incentives

The corporate rate of tax on income is 40 percent in Colombia and with respect to dividends, there is a 20 percent withholding tax. It is probable that a special tax package would be negotiated with respect to a nodule processing plant.

4. Physical Environment

Colombia's main existing port in the Pacific is at Buenaventura which fails as an acceptable harbor for three main reasons: (a) it is too shallow (less than 10 meters), (b) land is not readily available, and (c) power costs would be higher (Mejia, 1984). Five port sites were considered in the Bechtel (1980) nodule processing study.

Bahia de Humboldt

Bahia de Cupica

Bahia Solano

Malaga (near Buenaventura)

Santa Maria

Solano was selected as a suitable location in the Bechtel study (1980) and in the present study because it has a protected

deep water harbor, and is in reasonable proximity to a potential large hydroelectric site (San Carlos). At Solano there is a small community of about 4,000 people, and Solano is one of Colombia's six free trade zones in which industry can locate with no restrictions on the importation of goods for processing.

Ship Size: It will be necessary to dredge a channel of 1-2 km to accommodate large ships carrying nodules.

Land Availability: There is plenty of available land in the Solano area for a processing site.

Infrastructure: Electricity would probably come from the new large hydroelectric plant at San Carlos about 180 km inland. Sufficient water is in the vicinity, however much of the infrastructure will have to be constructed because the site is basically undeveloped. Owing to the limited number of local laborers, perhaps 75 percent of the labor requirements may have to be brought in from other areas of Colombia.

ECUADOR

I. COUNTRY POLICIES

1. Policies Toward Mining and Processing

Ecuador has not had particularly favorable attitudes and regulations toward the mining industry, and, as a consequence, foreign investments in mining are at low levels. However, the recently elected pro-business president, Leon Febres Cordero, is attempting to promote and increase foreign investments in order to help solve the nation's pressing economic problems. With respect to mining, Ecuador is now actively seeking foreign investors in the minerals sector. The government reports that a new mining law will be established with incentives to attract foreign investment (Puig, 1984).

Foreign investment in Ecuador, Bolivia, Chile, Colombia, Peru, and Venezuela is governed by the Andean Foreign Investment Code, which limits investment and requires the eventual transfer to majority national ownership (U.S. Embassy, Ecuador, 1984). However, foreign enterprises such as the proposed nodule processing plant (which will export its production) may not have to comply to majority national ownership requirements.

The U.S. Embassy report on "The Investment Climate in Ecuador" (1984) indicates that the hydrocarbons sector has had significant problems in the past. The report states:

Hydrocarbons (petroleum and natural gas) companies from the United States that have become involved in Ecuador have had mixed experiences. New policies instituted by the military government in 1972 led to a decision by most of the U.S. and other foreign-based petroleum companies then involved in Ecuador to leave the country. In the mid-1970s Gulf Oil Company and the Government came to an agreement whereby Gulf sold its share in the Texaco/Gulf/CEPE Consortium and in the

Trans-Ecuadorean Pipeline System to the state oil company. The Government's cancellation of natural gas concessions during the 1970s discouraged many private oil companies. In late 1982, the Government unilaterally cancelled its contract with PERMARCO, a Mexican firm which had been drilling in the Gulf of Guayaquil. Texaco and City Investing Company (owned by the Clyde Petroleum Group) continued operating in Ecuador. Three U.S.-based companies are currently negotiating with the GOE to undertake hydrocarbons exploratory activities in four large tracts.

2. Policies Toward a Manganese Nodule Processing Plant

Past policies and legislation may not provide an accurate indication of the government's attitudes toward a nodule processing plant. The combination of deteriorating economic conditions in the country and the present pro-business president signal increased efforts to attract foreign investment. Regarding the possible establishment of a nodule processing plant in Ecuador, the new minister of Industries, Commerce, and Integration, Xavier Neira Menendex, implied that the government would view such an investment very favorably providing it took place under international laws. It is assumed that nodule production would not be in countervention of the UN Law of the Sea Treaty. The minister stated that such a large investment would not fall under the existing complicated legislation. Favorable terms to the investor could be obtained that would include assurances of repatriation of the foreign investor's share of investment.

As is true with Colombia, any major investments in Ecuador would require active assistance from one of the major Ecuadorean law firms.

II. MINERALS INDUSTRY INVESTMENT

1. The Ecuadorean Minerals Sector

In the early 1960s, Ecuador set out to identify the scope of its mineral resources by establishing exploration programs with assistance from the UN. Southern Ecuador was the focus initially. During the 1970s, exploration increased with the participation of foreign private companies and technical cooperation missions from Great Britain, Belgium, and Spain. Most past and current mining activity has been in small scale and substantial areas have only been partially explored. Reportedly, "Ecuador is actively seeking joint ventures and/or risk-sharing exploration contracts in newly defined areas having nonferrous mineral potential." (Puig, 1984).

During 1975-80, the Bureau of Geology and Mines, with assistance from the Institute of Geological Sciences from Great Britain, explored parts of Ecuador having significant copper, lead, zinc, cobalt, and nickel mineralizations. The Belgium government is currently providing assistance in the exploration of massive sulfide deposits. Investments by U.S. minerals companies have been almost entirely in the petroleum sector.

The total of all foreign investment in Ecuador amounts to about \$1 billion, with the U.S. accounting for about 60%, Western Europe 20%, and Latin countries 15%. The registered foreign investment in 1983 totaled about \$90 million (U.S. Embassy, Ecuador, 1984).

2. Industry Views Toward Investment

As previously noted, foreign companies have had varying success in Ecuador with the most serious problems occurring in the petroleum sector. Investors seeking to carry out large-scale projects have encountered labor problems, a failure of government to remove illegal squatters from industrial sites, and slow decision making by the government bureaucracy.

The mining industry has tended to overlook Ecuador in recent years because of unfavorable publicity concerning the treatment of foreign investors in selected sectors. Presently, industry appears to rank Ecuador in the lower one-third of countries with respect to the investment climate. It is too soon to determine whether the more pro-business goals of the present government will be effective--clearly the intent is to move Ecuador up the investment-climate scale.

III. ECONOMIC ENVIRONMENT

1. Labor Costs

In late 1984, the minimum industrial-commercial wage in Ecuador was 6,600 sucres per month, or \$98 at the exchange rate of the same period (U.S. Embassy, Ecuador, 1984). Wages increase with the cost-of-living allowances. Most salaried workers are entitled to allowances, subsidies, and extra-month salaries which increase the base wage by up to 70 percent. The work week is similar to the U.S., with 8 hour days and 40 hour work weeks. Skilled labor in a nodule processing plant will probably be paid substantially more (i.e., in the \$500/mo. range).

Ecuador has a shortage of managerial personnel, and, consequently, they are well paid. Usually a company must use 80 percent Ecuadorean labor in their work force and train at least three nationals per year for managerial-type positions. A union is often established after the first 6 months of operation of a company. Upon its formation, signatures on a Collective Agreement are requested. Laborers frequently go on strike without fulfilling legal provisions, but they are rarely declared illegal. Laborers usually have the advantage in agreements. The number of legal plant-level collective disputes declined from 424 in 1980 to 328 in 1983.

2. Energy Costs

Ecuador is pursuing a path of intensive energy development in both petroleum and hydropower. In 1983, power output increased by 30 percent. Installed electric capacity reached 1,386 MW, while consumption decreased to 760 MW. Utilities grew slightly more than 15 percent in the midst of a serious economic crisis.

Hydropower is currently being developed in many areas of the country. Useable and technically feasible hydro potential is about 30,000 MW (Spurrier, 1984). Hydropower recently surpassed thermal energy power output, generating 66 percent of the country's requirements. The government presently supplies electricity at highly subsidized rates. It is anticipated that subsidies will be gradually removed over the next decade.

3. Inflation and Exchange Rates

Foreign companies in Ecuador must sell their currency at official exchange rates in order to acquire sucres to pay their expenses. Ecuador has a legal provision that requires foreign companies to use the official market rather than the higher free market. Again, from a longer-term perspective, and with respect to a major nodule processing plant, it is likely that exchange rate terms will reflect free market rates. The rate of inflation averaged 14.5 percent during the period 1970-1982 (World Bank, 1984a).

4. Taxation

Ecuador has a rather complicated set of tax provisions that result in tax levels in the 50-60 percent range (Fabian Ponce O. & Asociados, 1984). Income tax is the main tax and is divided into two parts: a) corporate tax, and b) withholding tax. The corporate tax rate is based on the rate of return, 40 percent times 0.4 times the rate of return stated as a whole number, and is applied after a deduction of a 15 percent contribution to labor as profit sharing. There is a 20 percent withholding on dividends to foreign corporations.

Secondly, as "withholding agent" the company has to withhold a percentage of various payments to professionals, and in all payments made abroad for fees, royalties, dividends, and other benefits.

In addition, "a foreign company doing business through a branch has to sell to the Central Bank the foreign currency at

the official exchange rate and obtain Ecuadorean currency, sucres, for the purpose of paying salaries, taxes, and other local expenses." (Fabian Ponce O. & Asociados, 1984). At the end of 1983 the official rate of exchange was about 57 percent of the free market rate (effectively an additional tax).

5. PHYSICAL ENVIRONMENT

Ecuador has six port sites along the Pacific coast (Sir William Halcrow and Partners, 1974). The port of Guayaquil receives the most traffic and handles approximately 60 percent of the foreign trade volume. As of 1981, the port of Guayaquil was in the process of expansion, but with a capacity of ships up to only 30,000 dwt as well as congestion in the port area, Guayaquil does not appear to be suitable as a nodule processing site.

The port of Esmeraldas can presently accommodate ships with a draft of only 10 m. However, it appears to have the potential for development into a deepwater port for ships up to 100,000 dwt. Esmeraldas is the site of a 55,000 b/d petroleum refinery. The Esmeraldas site may be suitable as a nodule processing site.

The director of the Oceanographic Institute at Guayaquil suggested that the Port of Manta may be the most suitable for development to accommodate a nodule processing site (Padilla, 1984). It is assumed for the purposes of the present study that the nodule processing plant would be located at Esmeraldas or Manta, shown in Figure 7.

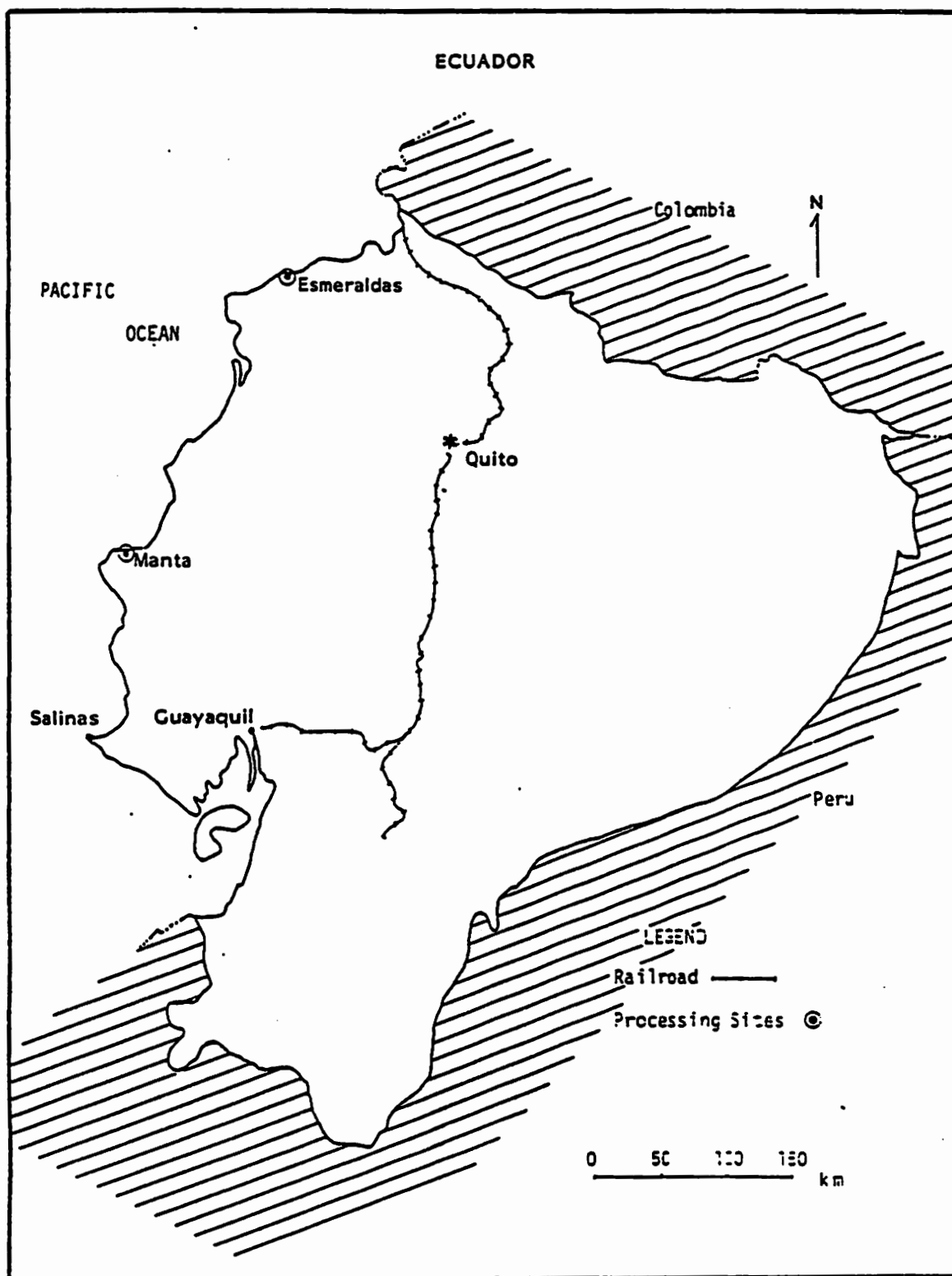


Figure 7. Ecuador Showing the Location of Two Possible Nodule Processing Sites at Esmeraldas and Manta

FIJI

I. COUNTRY POLICIES

1. Policies Toward Mining and Processing

The Fiji government actively seeks foreign investment in the minerals sector. To better promote foreign and local investment, the Fiji Government has established the Economic Development Board, a government statutory body under the Minister for Economic Planning and Development. The Fiji Government's policy position on foreign investment is as follows (Economic Development Board of Fiji, 1984):

The Government recognizes that foreign capital, technology and management can make enormous contributions to Fiji's economic and social development and those who provide it are entitled to suitable rewards.

Foreign investment is, in particular, welcome where:

- (i) it introduces technical expertise (management, engineering & technological) which would otherwise be unavailable;
- (ii) the local entrepreneurs do not have sufficient funds to finance the project;
- (iii) management and marketing expertise is so specialised and of such a high standard that the enterprise could not be run without it;
- (iv) the proposed venture substantially satisfies some of such criteria as:
 - (a) employment content;
 - (b) contribution to local value added;
 - (c) contribution to the development of economically depressed areas;
 - (d) conservation or generation of foreign exchange;
 - (e) contribution to trade within the South Pacific;
 - (f) price levels of output;
 - (g) generation of skills;
 - (h) linkage effect;
 - (i) local equity participation;
 - (j) use of local raw materials;
 - (k) environmental effect of the project.

With respect to the minerals sector, the Fiji government promotes foreign investment in minerals exploration and development through the Ministry of Lands, Energy, and Mineral Resources. There is one medium-size gold mine in the country which is controlled by Australian mining interests. A number of major foreign mining companies have undertaken exploration programs in Fiji during the past decade. One major low-grade copper discovery at Namosi was evaluated by an international mining consortium in the late 1970s at a total cost of about \$15 million. This potential mine had an estimated capital investment of about \$700 million, however, due to the low copper grade and low copper prices, the pre-feasibility study results were not favorable (Viti Copper Ltd., 1980). However, the planning and negotiations surrounding this potential major development demonstrated the Fiji government's keen interest in having a major minerals development in Fiji that would be compatible with the overall social and economic goals of the nation. As stated in the London-based Mining Annual Review (Mining Journal, 1984), "The country...provides an enlightened mineral development policy as well as political stability."

2. Policies Toward a Manganese Nodule Processing Plant

The Fiji government is a strong supporter of the Law of the Sea Treaty. A former undersecretary for Foreign Affairs was also undersecretary for the Law of the Sea Convention. The Fiji government attempted to have the Law of the Sea Authority located

in Fiji. It is safe to conclude that any processing of nodules within Fiji would only take place under the Law of the Sea Convention.

Assuming the above conditions were met, the Fiji government would probably firmly support the siting of a nodule processing site in Fiji providing it meets Fiji laws and regulations particularly with respect to any possible pollution. With an economy heavily dependent on the tourist industry (based largely on Fiji's excellent tropical climate and fine beach resorts), it must be concluded that strong environmental controls will apply to any major nodule processing plant developed in Fiji.

II. MINERALS INVESTMENT EXPERIENCE

Fiji is by far the smallest country included in this study. The nation's land area is 18,000 km², which is only 6 percent of the land area of Ecuador--the next smallest country in this study. Therefore, it would not be anticipated that the country would have a major minerals industry. As shown in Table 24, Fiji's mineral industry is modest. The small size of the minerals industry is not because of unfavorable mineral policies but because of the nation's limited minerals potential. The only mine producing minerals for export, the Emperor Gold Mine, achieved an all-time high in 1983 of \$17.2 million in sales. In 1983, major international mining companies holding prospecting licenses in Fiji included Utah International (U.S.A), Placer Exploration (Canada), Newmont (U.S.A.), Consolidated Gold Fields

Table 24

TRENDS IN FIJI'S MINERALS SECTOR

	1977	1978	1979	1980	1981	1982
Value of Gold and Silver (\$M)	7.2	5.1	7.1	15.3	14.0	16.8
Value of Quarried Material (\$M)	1.1	1.5	1.5	3.0	4.1	8.5
Total Value of Minerals (\$M)	8.3	6.6	8.6	18.3	18.1	25.4
Employment (approx 80-85% Fijian)	2014	883	701	1275	1170	1261
Prospecting Licenses	33	39	28	35	28	24
Mining Leases/Permits	3	3	3	3	2	1

Mineral Resources Department, 1982, 1983, and 1984.

(United Kingdom), Anglo American (South Africa), Preussag (West Germany), Freeport of Australia (U.S.A.) and Western Mining (Australia) (Mining Journal, 1984).

1. Industry Views toward Investment

The list of top international mining firms holding exploration licenses in Fiji in 1983 indicates a favorable industry view toward investment in Australia. One major Australian mining company ranked Fiji behind Australia and Canada and ahead of Columbia, Ecuador, and the Philippines with respect to its investment climate. The problem with Fiji has been the lack of suitable minerals investments, not government policies.

III. ECONOMIC ENVIRONMENT

The economy is well managed by a relatively efficient civil service with very little corruption compared to most other developing countries. In recent years, Fiji's economy has been hit by falling commodity prices for sugar and the costs associated with two destructive cyclones in 1983 and again in 1985. There are about 3000 registered companies in Fiji, of which about 10 percent have head offices overseas. The long-term economic outlook for Fiji is that it will outperform most other Pacific Island nations, and maintain an open door policy toward foreign investment.

1. Labor Costs

Labor costs are very low compared to major developed countries--but high relative to some Asian countries, such as the

Philippines. As shown in Figure 3 typical wages are in the same bracket as Columbia and Ecuador--in the \$1.50 to \$2.00 per hour range. Senior Fijian management costs are relatively high for a developing country, ranging from about \$25,000 to \$35,000 per year.

2. Energy Costs

Fiji has modest undeveloped hydroelectric potential (on the main island of Viti Levu) of between 110 and 140 MW. With a demand growth on the order of 10 percent per year from the present 50-60 MW, most of the spare hydrocapacity will be committed by the year 2000. Electricity costs are very high, with the best rates for major consumers of about 10 cents/kwh. If a new coal-fired power plant were built associated with a nodule processing plant, the best that could be envisioned would be about 6.5 cents/kwh.

3. Inflation and Exchanges Rates

From 1970-1982, the average rate of inflation of Gross Domestic Product was 11.7 percent (World Bank, 1984a). The exchange rate in Fiji dollars to one dollar devalued by an average of about 1.4 percent per year between 1970 and 1983.

4. Taxation, Incentives, and Exchange Controls

Resident companies operating in Fiji pay an income tax on chargeable income of 37.5 percent, plus several withholding taxes including 15 percent withholding tax on the profit element on

management or supervision fees paid to non-residents. Non-resident companies pay a tax of 45 percent on taxable income. With respect to "...mining companies, the Minister of finance may, where he is satisfied that it is expedient for economic development of Fiji, exempt, either fully or in part, and for any period, the income of the company" (Economic Development Board of Fiji, 1984). Typically, a 22.5 percent rate has been applied to mining companies. Whether such flexibility would be available for nodule processing is not known, but it is believed that the Fiji government would consider tax concessions if the project appeared beneficial to Fiji's economic development strategy.

"Repatriation of capital which has been introduced from overseas sources through the local banking system or otherwise recorded with the Reserve Bank is assured. There are no restrictions on the remittance of dividends, profits, royalties, loan repayments, settlement of trade debts and similar current payments, provided local tax clearances have been obtained for such remittances" (Economic Development Board of Fiji, 1984).

5. Physical Environment

The two main ports in Fiji at Suva and Lautoka are unsuitable for ships of the size envisioned for nodule processing. Suva can accommodate vessels with a draft of up to 11.6 m and Lautoka up to 11.0 m (Ports Authority of Fiji, 1979). In addition, there would be severe difficulties in obtaining suitable land in the populated Suva area. There is more land near Lautoka, however this area is in close proximity to the tourist industry.

The best harbor site in Fiji is probably at Savusavu (Figure 8) on Vanua Levu Island to the north of the main island of Viti Levu. The Economic Development Board of Fiji reports that Savusavu harbor could accommodate vessels with a draft of 15-16 m (personal communication, 1984). The island of Vanua Levu and associated port at Savusavu are relatively undeveloped and would require major investments.

A second possible site is at Korovou Bay, west of Suva. This site was considered in the Namosi Joint Venture study (Viti Copper Ltd., 1980) as the port for export of copper concentrates and import of mine material requirements.

Land Availability: There is reportedly sufficient land available near Savusavu and the alternate site at Korovou Bay for a nodule processing plant.

Infrastructure: Infrastructure is limited at Savusavu. In particular, there is insufficient water or power. Whereas a coal-fired power plant might be built, water may be a serious problem. Substantial investments in water facilities would be required regardless of the location of a nodule processing facility in Fiji. For the Korovou Bay option, it is assumed that sufficient water can be obtained from the nearby Wainikoroiluva River. In the early 1980s, the commercial rate for water was relatively high at about \$1.00 per thousand gallons. The advantage of the Korovou Bay site is that more infrastructure exists in the area and there is an available workforce in the

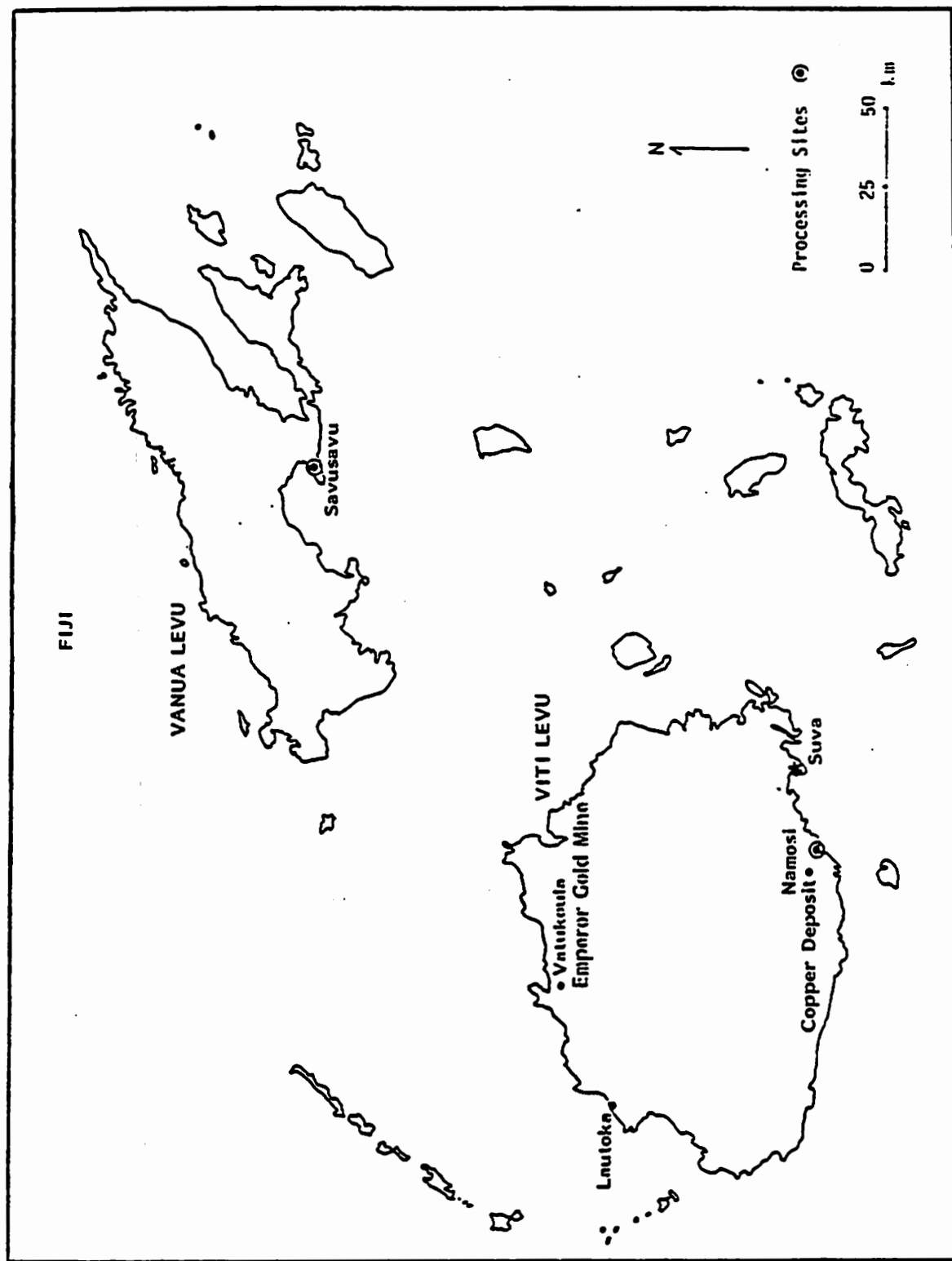


Figure 8. Fiji Showing Possible Nodule Processing Sites at Savusavu and Near Namosi

vicinity at Suva. However, Korovou Bay probably could not accommodate 100,000 dwt ships. The main advantage of Savusavu is it is reportedly a very good port site and could be developed to accommodate 100,000 dwt ships.

PHILIPPINES

I. COUNTRY POLICIES

1. Policies Toward Mining and Processing

After Marcos declared martial law in 1972 there was a shift in development strategy toward projects that could increase exports. In conjunction with this strategy, the government has actively promoted foreign investment through tax exemptions and financial and technical assistance. Although the government sought foreign investment in the minerals sector it limits foreign ownership in the minerals production to 40 percent.

It is not the stated government policies toward foreign investments that are the prime concern of foreign investors. It is the perception of major investors that corruption is widespread, and their concerns about the longer-term political stability of the Philippines. A Fortune magazine article emphasized the first point as follows: "Of all the country's problems, the one that most seriously undermines the confidence of international bankers and investors is the high-level corruption that pervades Philippine life...." (Kraar, 1981). More recently, the assassination of Benigno Aquino in 1983 appears to have resulted in capital flight from the Philippines as nervous investors withdrew funds in the months following the assassination.

The resulting financial pressure caused the Philippine government to institute stiffer exchange controls, devaluation of the peso and a short-term moratorium on principal payments on the nation's \$25 billion in foreign debts (Tarr, 1984).

The long-term implications of the above two problems on investor confidence are impossible to predict. By the 1990s, when a nodule processing facility might be considered, the present political environment may be quite different--but the direction of change must remain uncertain in the present uncertain political environment.

2. Policies Toward a Manganese Nodule Processing Plant

During discussions with Philippine government officials, it was not clear how supportive government would be towards establishment of a manganese nodule processing plant in the Philippines. Based on the government's strong support for establishment of other major metal processing plants (copper and aluminum smelters and an integrated steel plant), it is assumed that the Philippine government would be supportive of such an investment. Because all minerals would be imported it is likely that the equity constraints placed on domestic mining would be waived or modified, and that some form of tax concession would be available.

II. MINERALS INDUSTRY INVESTMENT EXPERIENCE

I. The Philippine Minerals Sector

As shown in Table 25, the Philippine minerals sector produces about \$1.5 billion per year in mineral commodities (excluding petroleum) with copper, gold, and nickel leading in value. Employment, at an estimated 100,000, is large in relation to the total value of production and reflects the intensive use

TABLE 25
PHILIPPINE MINERALS PRODUCTION^a, 1983

	Tonnes	Million dollars
Total Value	—	1,450
Gold	25.16	315
Silver	59.31	16
Copper (in conc.)	273,196	453 ^e
Zinc (in conc.)	2,196	2 ^e
Nickel (metal)	9,489	
Nickel (ore)	350,161	120 ^e
Molybdenum	38	*
Cobalt	578	12 ^e
Chrome ore	284,358	22 ^e
Manganese ore	1,540	*
Nonmetallics	---	510 ^e

^aMining Journal, 1984; excludes petroleum and coal.

^eestimate

*less than 1 million

of very low-cost labor in many mines. The total value of minerals production has fluctuated within the range of \$1250-1550 million during the 1979-1983 period (Mining Journal, 1979-1984).

The major mining companies shown in Table 26 are modest in size by U.S. standards and are Philippine controlled.

2. Industry Views Toward Investment

The views of Australian and Canadian mining company executives and independent consultants were obtained during this research study. There was almost universal agreement that the Philippines was not an acceptable environment for investment at this time. An executive of a major foreign company reported that after considerable expense in feasibility studies they shelved a major mineral processing plant in the Philippines because of the uncertain political environment. Another industry representative familiar with the Philippines reported that major companies will not invest in the Philippines because the First Family, relatives, and friends take too much out of the front end of projects. A representative from another foreign mining company reported that his company presently operates in the Philippines, however, it will not expand its activities because of a range of problems in dealing with the government, including the way it pressures industry into uneconomic decisions (i.e., companies reportedly pay 35-40 percent more to smelt copper in the Philippines than in Japan.)

TABLE 26

MAJOR MINING COMPANIES IN THE PHILIPPINES

Name	Country of Incorporation	Gross Operating Income in 1979 (million dollars)
Atlas Consolidated	Philippines	286
Marinduque	"	274
Benquet Consolidated	"	243a
Marcopper	"	77a
Lepanto Consolidated	"	75
Philex Mining	"	72
Consolidated Mines	"	36
Acoje Mines	"	16

a1980

Mining Journal, 1980

It should be noted that some foreign investment is continuing to flow into the Philippines in spite of the generally negative attitude of industry. In 1983, \$268 million was invested in the Philippines, with United States investment accounting for 68 percent of all investment. The mining sector received a very modest 7.5 percent (\$20 million) of all investment in 1983 (Board of Investment, 1984).

III. ECONOMIC ENVIRONMENT

1. Labor Costs

As shown in Figure 3, the Philippines has the lowest labor costs of the six countries examined. Average costs reported in mining in 1982 were about 60 cents per hour, less than 5 percent of the average wage in the mining industry of Australia, Canada, and the United States.

The Philippines appears to have a worsening income distribution over time--a possible warning sign of potential social unrest. "The poorest 60 percent of total households, which received only 25.0 percent of total income in 1971, suffered a further decline of their share to 22.5 percent in 1979 while the richest 10 percent of households increased their share of total income from 37.1 percent in 1971 to 41.7 percent in 1979" (Canlas et al., 1984).

2. Energy Costs

Although the Philippines has moderate amounts of geothermal power, energy costs for large supplies of electricity are

expected to be high relative to Australia, Canada, Colombia, and Ecuador. Mines generate their own electricity at costs of over 10 cents/kwh. Assuming the establishment of a new coal-fired power plant, the lowest cost that could be achieved would be about 6.5 cents/kwh. On Mindanao prices as low as 2.5 cents/kwh were reported in 1980, but probably could not meet the large requirements of a nodule processing plant (Australian Trade Development Council, 1980). Information on the quantity and prices of electricity in the Philippines is limited.

3. Inflation, Exchange Rates, and Exchange Control

During the 1970-82 period the average rate of inflation of Gross Domestic Product averaged 12.8 percent (World Bank, 1984a). The exchange rate in Philippine pesos per dollar devalued at an average rate of 5.6 percent per year between 1970 and 1983.

All investors and enterprises are entitled to the following guarantees provided in the Constitution:

- (1) Right to repatriate investments and remit earnings,
- (2) Right to remit foreign exchange to service foreign loans and obligations arising from technical assistance contracts, and
- (3) Freedom from expropriation of investment.

There are however a number of restrictions on specific types of payments (i.e., royalties are subject to 35 percent withholding tax) (Price Waterhouse, 1981b).

4. Taxation and Incentives

The Philippine tax system contains a complex array of provisions. Overall, the taxation levels in the Philippines are modest at 35 percent of taxable corporate income (25 percent on taxable income below about \$9000). With respect to dividends, if the shareholder is a domestic or foreign corporation, there is a 10 percent withholding tax, and if the shareholder is a nonresident foreign corporation, the withholding tax ranges from 10 to 35 percent. Royalties paid to domestic or resident corporations are subject to a withholding tax of 10 percent (Price Waterhouse, 1981). It is probable that some tax incentives would be available for a major project such as a manganese nodule processing plant.

5. Physical Environment

There are numerous possible sites for a manganese nodule processing plant in the Philippines. Two sites suggested as potentially the most favorable are the copper smelter site on Leyte and the proposed integrated steel plant on Mindanao (Figure 9).

Ship Size: Both ports reportedly can accommodate ships of at least 80,000 dwt.

Land Availability: Sufficient land is available.

Disposal Site: Assumed to be available.

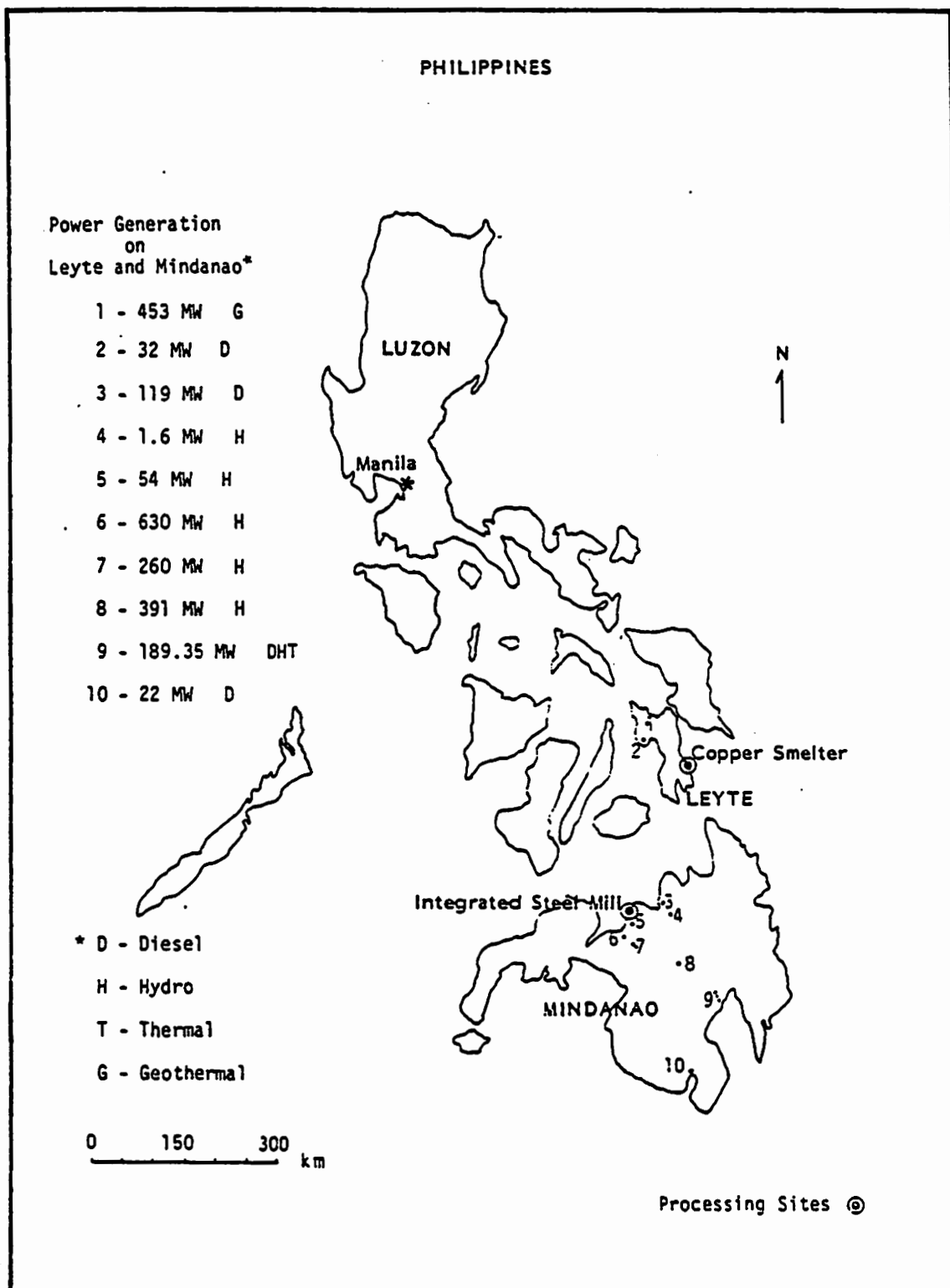


Figure 9. Philippines Showing Two Possible Sites for a Nodule Processing Plant.

Infrastructure: Insufficient power and water are available at both sites. At the smelter site on Leyte there is moderate potential for expansion of geothermal energy, however, probably not in sufficient quantities to meet the electricity needs of a nodule processing facility. Likewise, at the proposed integrated steel plant there would probably be hydroelectric power but insufficient amounts to meet the requirements of a nodule processing facility.

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APPENDIX I

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Note: Most industry comments on the Philippines
were obtained outside of the Philippines.

APPENDIX II

EUROMONEY CREDIT RATINGS, 1984

Percentile Rank ^a	Country	Percentile Rank ^a	Country	Percentile Rank ^a	Country
99	United States	66	Iceland	34	Angola
98	Germany	65	Qatar	33	Yugoslavia
97	Japan	64	Turkey	32	Morocco
97	United Kingdom	63	Jordan	31	Peru
96	Switzerland	62	Colombia	30	Bangladesh
95	Australia	61	Trinidad/Tobago	29	Guatemala
94	Canada	60	Bermuda	28	Swaziland
93	Sweden	59	Egypt	28	Libya
92	Finland	59	Mexico	27	Ethiopia
91	Austria	58	Papua New Guinea	26	Brazil
91	Netherlands			25	Costa Rica
90	Norway	57	Cyprus	24	Mauritius
89	New Zealand	56	Paraguay	23	Cuba
88	France	55	Hungary	22	Jamaica
87	Saudi Arabia	54	Venezuela	22	Romania
86	Singapore	53	Panama	21	Guyana
85	Belgium	53	Iraq	20	Poland
84	Denmark	52	Burma	19	Uruguay
84	Italy	51	Bulgaria	18	Malta
83	China	50	Bahrain	17	Argentina
82	Spain	49	Barbados	16	Honduras
81	Ireland	48	Botswana	16	Mauritania
80	Kuwait	47	Syria	15	Tanzania
79	Malaysia	47	Pakistan	14	Ecuador
78	Indonesia	46	Gabon	13	Liberia
78	Tunisia	45	Sri Lanka	12	Malawi
77	Taiwan	44	Cameroon	11	Iran
76	South Africa	43	Fiji	10	Venezuela
75	Greece	42	Congo	9	Niger
74	Korea	41	Nauru	9	Bolivia
73	Thailand	41	Solomon Islands	9	Haiti
72	Hong Kong	40	Nigeria	7	Lesotho
72	India	39	Zimbabwe	6	Zambia
71	U.S.S.R.	38	Mozambique	5	Chile
70	Algeria	37	Kenya	4	Senegal
69	Czechoslovakia	36	Ivory Coast	3	Ghana
68	Portugal	35	Lebanon	3	Dominican Rep.
67	U. Arab Emirates	34	Philippines	2	Sudan
66	East Germany			1	El Salvador
				0	Uganda

^aThe key criteria for ranking were: 1) access to the market, 2) the terms it actually obtained, or failing that, as assessed by the market, 3) selling down—the success of the transactions.

The markets considered were: 1) the bond market, from the most demanding, the Yankee bond market, to Eurobonds, FRNs, revolving underwriting facilities, and bankers acceptances, 2) the Euroloan market—from major dollar syndications, priced over Libor with prime and CD options, to Deutschemark loans, localized syndications, club deals and one-to-one bank loans, 3) the à forfait market, as quoted by secondary marketmakers, and, in cases where no market is made, a market judgement, 4) trade finance—a market judgement on the type of finance to which the country has access—letter of credit, cash against documents, cash in advance.

The weighting was as follows: Access to markets 50%
Terms obtained (spread/maturity) 30 percent
Sell-down 20 percent

The Euromoney rankings were converted to percentile rankings as follows:
$$\text{percentile} = \left(\frac{\text{Total No. Countries} - \text{Country Rank}}{\text{Total No. Countries}} \right) 100$$

Euromoney, 1984

APPENDIX III

INSTITUTIONAL INVESTOR'S CREDIT RATING, 1984

Percentile Rank ^a	Country	Percentile Rank ^a	Country	Percentile Rank ^a	Country
99	United States	66	Oman	32	Argentina
98	Japan	65	Indonesia	31	Philippines
97	Switzerland	64	Trinidad & Tobago	30	Romania
96	West Germany	63	Portugal	29	Iraq
95	United Kingdom	62	India	28	Mauritius
94	Norway	61	Hungary	28	Zimbabwe
94	Canada	61	Colombia	27	Iran
93	Netherlands	60	Tunisia	26	Syria
92	Australia	59	East Germany	25	Congo
91	Austria	58	Czechoslovakia	24	Senegal
90	Singapore	57	Bulgaria	23	Malawi
89	France	56	Papua New Guinea	22	Costa Rica
88	Sweden	55	Mexico	21	Jamaica
87	Finland	54	Venezuela	20	Bangladesh
86	Belgium	53	Jordan	19	Dominican Rep.
85	Italy	52	Gabon	18	Angola
84	Denmark	51	Cameroon	17	Lebanon
83	New Zealand	50	Paraguay	17	Poland
83	Saudi Arabia	49	Panama	16	Cuba
82	Taiwan	48	Egypt	15	Guatemala
81	Malaysia	47	Libya	14	Seychelles
80	China	46	Barbados	13	Liberia
79	Hong Kong	45	Turkey	12	Honduras
78	Spain	44	Israel	11	Zambia
77	U.S.S.R.	43	Nigeria	10	Ethiopia
76	Kuwait	42	Brazil	9	Haiti
75	Ireland	41	Yugoslavia	8	Grenada
74	United Arab Emirates	40	Ivory Coast	7	Tanzania
73	South Africa	39	Uruguay	6	Bolivia
72	South Korea	39	Kenya	6	Sierra Leone
72	Bahrain	38	Chile	5	Sudan
71	Qatar	37	Sri Lanka	4	El Salvador
70	Algeria	36	Ecuador	3	Zaire
69	Thailand	35	Morocco	2	Nicaragua
68	Iceland	34	Pakistan	1	Uganda
67	Greece	33	Peru	0	North Korea

^aInstitutional Investor, 1984. The country-by-country credit ratings developed by Institutional Investor are based on ratings provided by leading international banks. Bankers are asked to rank each country according to credit worthiness. The sample for the study ranges from 75 to 100 banks, each of which provides its own ratings. Banks are not permitted to rate their home countries. The individual responses are weighted, using an Institutional Investor formula that gives more weight to responses from banks with the

largest worldwide exposure and the most sophisticated country analysis systems. The order of rank of each country has been converted to a percentile rank using the following formula:

$$\text{Percentile Rank} = \left(\frac{\text{Total No. Countries} \times \text{Country Rank}}{\text{Total No. Countries}} \right) 100$$

APPENDIX IV

COUNTRY ECONOMIC PERFORMANCE, 1974-1984

Overall Percentile Rank	Country	Real GDP Growth	Inflation Rate (Consumer Prices)	Exchange Rate In Terms of SDR's	Current Export Growth	Account Perfor- mance
99	Singapore	99	98	97	99	16
98	Taiwan	98	81	83	98	99
97	Malaysia	94	95	94	97	37
96	Hong Kong	96	77	51	96	46
95	Saudi Arabia	83	90	92	94	97
94	Thailand	90	74	76	90	62
92	Burma	84	96	62	92	32
91	Japan	73	92	99	95	94
90	Cyprus	85	82	58	91	23
89	Korea	97	32	40	89	58
88	Algeria	89	54	73	79	63
87	Panama	78	89	91	85	28
86	Syria	87	46	82	67	91
85	Botswana	86	56	60	82	38
84	Egypt	95	45	25	81	56
83	Pakistan	82	71	63	78	65
82	Tunisia	88	78	45	59	27
81	Bahrain	62	68	95	88	40
80	Paraguay	92	41	59	39	60
78	India	70	86	70	81	81
77	Indonesia	91	38	26	69	74
76	Honduras	66	69	90	71	15
75	Austria	37	94	81	86	78
74	Trinidad/Tobago	75	39	78	55	95
73	Libya	81	37	89	32	89
72	United States	45	80	88	76	48
71	Bahamas	40	84	87	77	44
70	Germany	31	97	77	84	85
69	Switzerland	14	99	98	87	87
68	Fiji	56	75	72	68	29
67	Qatar	68	26	96	54	98
66	Norway	58	72	57	72	92
65	Netherlands	29	91	74	73	49
63	Finland	53	61	52	70	72
62	Kuwait	41	85	86	49	90
61	Canada	35	73	69	75	76
60	Luxembourg	48	88	56	58	2
59	Philippines	76	49	28	51	59
58	Kenya	74	44	46	42	20
57	Mali	63	47	43	59	9
56	Australia	43	63	66	65	70
55	Malawi	61	57	54	44	14
54	Guatemala	51	76	71	43	35

53	Papua New Guinea	23	83	80	63	31
52	Dominican Republic	69	67	48	37	26
51	Ethiopia	33	62	85	46	33
49	Sri Lanka	80	51	19	41	24
48	Belgium	22	87	55	74	77
47	Ireland	54	34	44	66	57
46	South Africa	39	48	53	61	43
45	France	34	58	41	56	82
44	Denmark	30	66	47	57	69
43	Morocco	59	66	33	30	54
42	United Kingdom	39	52	65	60	83
41	Ecuador	72	30	23	35	66
40	Sweden	16	64	35	53	73
39	Gabon	18	43	42	52	96
38	Zimbabwe	26	55	37	40	30
37	Mauritania	11	59	68	38	5
35	Italy	32	29	27	45	45
34	New Zealand	15	42	34	47	25
33	Mauritius	42	33	30	26	42
32	Spain	25	28	24	48	71
31	Venezuela	24	53	32	29	86
30	Greece	47	25	20	31	61
29	Nigeria	12	27	75	27	80
28	Colombia	67	16	22	25	75
27	Senegal	13	70	38	24	18
26	El Salvador	3	40	84	34	39
25	Portugal	55	20	16	28	55
24	Sierra Leone	46	17	29	18	12
23	Tanzania	27	23	39	17	17
22	Mexico	77	12	13	33	67
20	Zambia	9	35	31	23	11
19	Costa Rica	44	22	15	20	22
18	Guyana	2	31	61	22	4
17	Sudan	71	18	17	9	13
16	Nicaragua	8	19	49	16	3
15	Yugoslavia	60	15	14	15	68
14	Jamaica	1	24	18	19	10
13	Iran	0	13	67	12	88
12	Turkey	52	11	8	14	53
11	Chile	57	8	12	13	6
10	Iceland	28	10	10	11	8
9	Uruguay	17	9	9	10	19
8	Uganda	20	14	6	1	47
6	Peru	38	4	3	8	51
5	Brazil	65	3	2	6	52
4	Zaire	4	6	5	5	1
3	Ghana	6	2	11	3	41
2	Bolivia	5	5	4	4	34
1	Israel	49	1	1	2	0
0	Argentina	97	0	0	0	84

Euromoney Ranking Method. The most important indicators of economic health—real GDP growth, consumer price inflation rate, currency strength in terms of Special Drawing Rights, current account balance relative to GDP, and

the strength of exports—were analyzed. Using computerized analysis techniques, a country's scores in each of the five indicators were combined into a single index which measures economic achievement over the period. This index combines all the information on each country. It works by giving a weight to each measure. The index for each country is the sum of its weighted scores on each measure. The index of performance gives a single summary statistic which can be used to compare any country with any other.

The Euromoney rankings were converted to percentile rankings as follows:

$$\text{Percentile Rank} = \left(\frac{\text{Total No. Countries} \times \text{Country Rank}}{\text{Total No. Countries}} \right) 100$$

Euromoney, 1984b

APPENDIX V

COUNTRY RANKINGS OF POLITICAL INSTABILITY^a

Country	Political Instability
1. Canada	A (Low)
2. Singapore	
3. Chile	
4. Venezuela	
5. Taiwan	
6. Mexico	B (Medium)
7. China	
8. Portugal	
9. India	
10. Peru	
11. Saudi Arabia	
12. Argentina	
13. Colombia	
14. Israel	
15. Nigeria	
16. Yugoslavia	
17. Brazil	
18. Greece	
19. Zambia	
20. Indonesia	
21. South Africa	
22. Italy	
23. Philippines	C (High)
24. Spain	
25. Thailand	
26. Turkey	
27. Pakistan	
28. Zaire	
29. Bolivia	
30. Iran	

^aThe six main factors considered in the country rankings of political instability are: (1) vulnerability to international markets, (2) internal economic performance, (3) demands of external financial institutions, (4) international conflicts, (5) political and fractional conflicts, (6) civilian-military struggles.

O'Leary and Coplin, 1981

APPENDIX VI

NODULE PROCESSING--A SIMPLIFIED DESCRIPTION

A processing facility has been envisioned that would be capable of handling 3 million dry tonnes of nodules in a year's time. This is equivalent to a plant throughput of over 8,200 tonnes per day. The plant would use a pyrometallurgical process to separate out nickel, copper, cobalt, and manganese. A typical nodule will contain the following percentages, by weight, of these four metals: nickel, 1.30 to 1.45 percent; copper, 1.00 to 1.24 percent; cobalt, 0.21 to 0.26 percent; and manganese, 26.8 to 27.8 percent. Not all of the contained metal will be recovered and estimates of the recovery efficiencies are 90 percent for nickel and copper, 70 percent for cobalt, and 85 percent for manganese. A plant capable of this throughput at these efficiencies would cost around \$1.1 billion to construct in the United States with environmental costs accounting for roughly 13 percent of this figure.

The following simplified description of the pyrometallurgical recovery process highlights the major steps involved in processing the feedstock from raw nodules into finished, saleable metals. For a more complete description of this and other alternative forms of nodule processing see A.D. Little (1984).

Raw nodules are moved from holding ponds to mills which will reduce the nodules to an appropriate size for processing. After grinding, the nodules are dried with hot gases in fluidized bed dryers. The dried nodule material is then mixed with coke and

roasted at high temperatures in a carbon monoxide-rich environment. This reduces manganese +4 oxide to +2 oxide. The resulting material is then conveyed to reduction furnaces for smelting.

Electrical furnaces melt the nodule material and most of the copper, cobalt, nickel, and some iron and manganese are reduced to a metallic state. These separate from the molten manganese-rich slag by gravity and are tapped off. The slag is skimmed off and transferred to manganese reduction furnaces for further processing into ferromanganese, silica manganese, and waste slag.

The alloy phase material that was tapped off is moved to converters that remove more manganese and iron by an oxidation/slag removal technique. This slag is then processed in the manganese reduction furnaces. A copper-nickel-cobalt sulfide matte is recovered from the converters and finely ground in preparation for acid leaching.

Metals are dissolved from the matte by leaching with hot sulfuric acid. The resulting leach liquor is cooled, with resulting solids then being removed for disposal. The "purified" liquor is then passed through a multi-stage ion exchange circuit where copper is extracted by an organic reagent process which yields a strip solution. Copper is then removed from the strip solution by an electrowinning technique that yields as an end product, commercially sized cathodes.

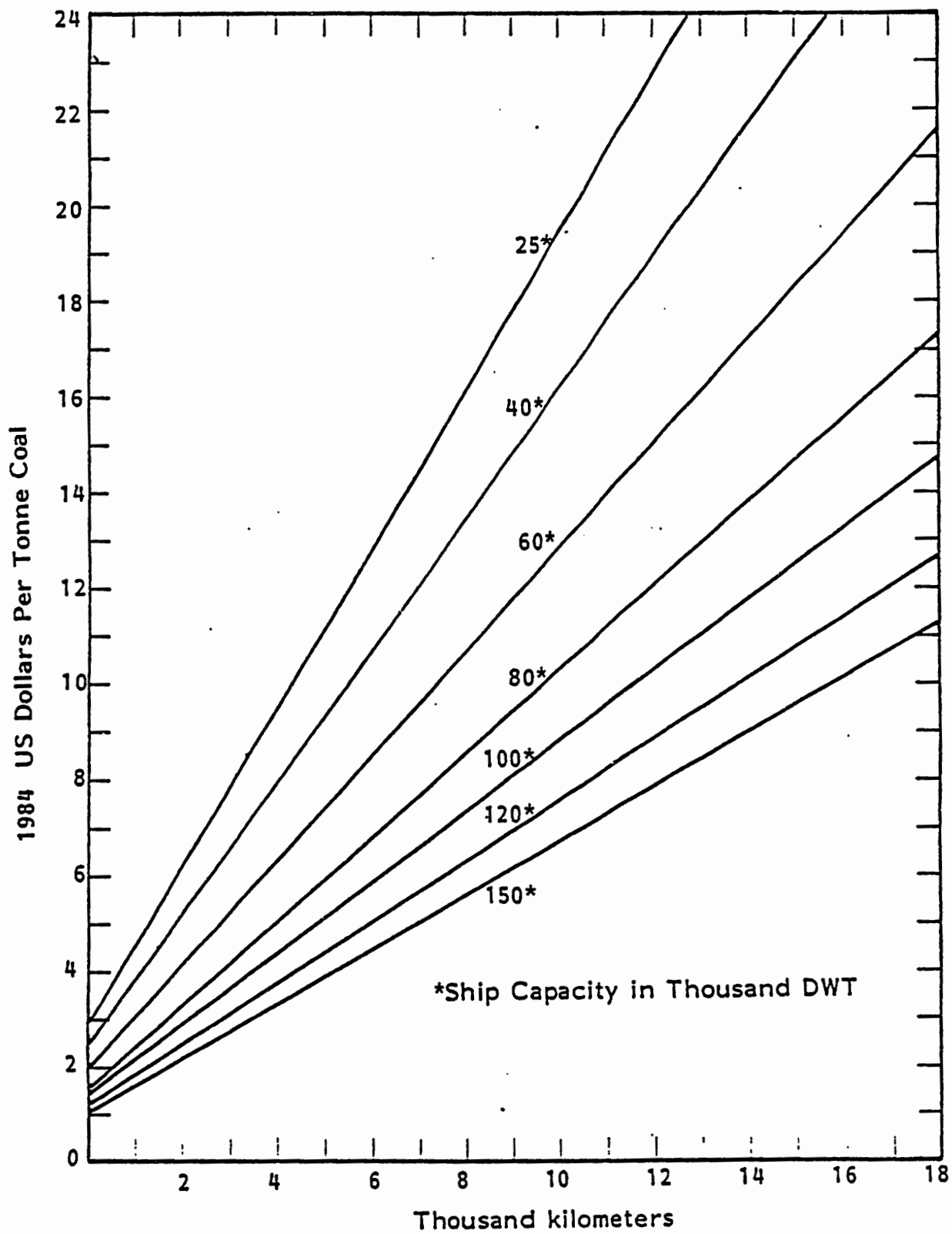
The raffinate from the copper removal stage is conditioned, then processed through a multistage liquid ion exchange circuit,

similar to that used to extract copper, to yield a nickel stripping solution. A complex extrowinning technique is then used to remove the nickel from the stripping solution.

The raffinate from the nickel removal step is further conditioned to remove residual zinc, copper, and nickel. The resulting cobalt containing solution is then processed by pH adjustment, precipitation, and hydrogen reduction to produce saleable cobalt briquettes.

APPENDIX VII

ESTIMATED LONG TERM COAL TRANSPORTATION COSTS*



APPENDIX VIIIA

PYROMETALLURGICAL PROCESS PLANT IN AUSTRALIA

(FOUR-METAL INTEGRATED PLANT)

(OPERATING COSTS IN 1984 DOLLARS)

	\$/unit	units/year ^a	M\$/year
Energy			
Coal	42	1,039,000	43.6
Coke	150*	426,700	64.0
Electricity (kwh)	.027	1793M	48.4
(bbl) oil #6	30*	390,010	11.7
(bbl) oil #2	34*	12,580	0.4
Subtotal			168.1
Nonenergy			
Lime (t)	75*	124,800	9.4
Limestone (t)	22*	113,900	2.5
Gypsum (t)	22*	367,300	8.1
Electrode materials (t)	400*	14,600	5.8
Sulfuric acid (t)	80*	124,800	10.0
Silica (t)	30*	138,300	4.2
Oxygen (t)	100*	251,900	25.2
Ion exchange (l)	7*	57,000	0.4
Hydrogen sulfide (t)	250*	5,940	1.5
Ammonia (t)	250*	1,020	0.3
Hydrogen (1000 m ³)	150*	3,040	0.5
Nitrogen (t)	165*	15,000	2.5
Subtotal			70.4
Water \$/thous gal	0.50*	3 billion gallons	1.5
Employment (person)	31,234	740	23.1
Maintenance/Taxes/Insurance			25.0
TOTAL			\$288.1

*standard for all countries

^aArthur D. Little, 1984

APPENDIX VIIIb

PYROMETALLURGICAL PROCESS PLANT IN CANADA

(FOUR-METAL INTEGRATED PLANT)

(OPERATING COSTS IN 1984 DOLLARS)

	\$/unit	units/year ^a	M\$/year
Energy			
Coal	46	1,039,000	47.8
Coke	150*	426,700	64.0
Electricity (kwh)	.022	1793M	39.5
(bbl) oil #6	30*	390,010	11.7
(bbl) oil #2	34*	12,580	0.4
Subtotal			163.4
Nonenergy			
Lime (t)	75*	124,800	9.4
Limestone (t)	22*	113,900	2.5
Gypsum (t)	22*	367,300	8.1
Electrode materials (t)	400*	14,600	5.8
Sulfuric acid (t)	80*	124,800	10.0
Silica (t)	30*	138,300	4.2
Oxygen (t)	100*	251,900	25.2
Ion exchange (l)	7*	57,000	0.4
Hydrogen sulfide (t)	250*	5,940	1.5
Ammonia (t)	250*	1,020	0.3
Hydrogen (1000 m ³)	150*	3,040	0.5
Nitrogen (t)	165*	15,000	2.5
Subtotal			70.4
Water \$/thous gal	0.50*	3 billion gallons	1.5
Employment (person)	36,800	740	27.2
Maintenance/Taxes/Insurance			25.0
TOTAL			\$287.5

*standard for all countries

^aArthur D. Little, 1984

APPENDIX VIIIc

PYROMETALLURGICAL PROCESS PLANT IN COLOMBIA

(FOUR-METAL INTEGRATED PLANT)

(OPERATING COSTS IN 1984 DOLLARS)

	\$/unit	units/year ^a	M\$/year
Energy			
Coal	47.5	1,039,000	49.3
Coke	150*	426,700	64.0
Electricity (kwh)	.035	1793M	62.8
(bbl) oil #6	30*	390,010	11.7
(bbl) oil #2	34*	12,580	0.4
Subtotal			188.2
Nonenergy			
Lime (t)	75*	124,800	9.4
Limestone (t)	22*	113,900	2.5
Gypsum (t)	22*	367,300	8.1
Electrode materials (t)	400*	14,600	5.8
Sulfuric acid (t)	80*	124,800	10.0
Silica (t)	30*	138,300	4.2
Oxygen (t)	100*	251,900	25.2
Ion exchange (l)	7*	57,000	0.4
Hydrogen sulfide (t)	250*	5,940	1.5
Ammonia (t)	250*	1,020	0.3
Hydrogen (1000 m ³)	150*	3,040	0.5
Nitrogen (t)	165*	15,000	2.5
Subtotal			70.4
Water \$/thous gal	0.50*	3 billion gallons	1.5
Employment (person)	11,383	890	10.1
Maintenance/Taxes/Insurance			25.0
TOTAL			\$295.2

*standard for all countries

^aArthur D. Little, 1984

APPENDIX VIIIId

PYROMETALLURGICAL PROCESS PLANT IN ECUADOR

(FOUR-METAL INTEGRATED PLANT)

(OPERATING COSTS IN 1984 DOLLARS)

	\$/unit	units/year ^a	M\$/year
Energy			
Coal	48	1,039,000	49.9
Coke	150*	426,700	64.0
Electricity (kwh)	.038	1793M	68.1
(bbl) oil #6	30*	390,010	11.7
(bbl) oil #2	34*	12,580	0.4
Subtotal			194.1
Nonenergy			
Lime (t)	75*	124,800	9.4
Limestone (t)	22*	113,900	2.5
Gypsum (t)	22*	367,300	8.1
Electrode materials (t)	400*	14,600	5.8
Sulfuric acid (t)	80*	124,800	10.0
Silica (t)	30*	138,300	4.2
Oxygen (t)	100*	251,900	25.2
Ion exchange (l)	7*	57,000	0.4
Hydrogen sulfide (t)	250*	5,940	1.5
Ammonia (t)	250*	1,020	0.3
Hydrogen (1000 m ³)	150*	3,040	0.5
Nitrogen (t)	165*	15,000	2.5
Subtotal			70.4
Water \$/thous gal	0.50*	3 billion gallons	1.5
Employment (person)	11,383	890	10.1
Maintenance/Taxes/Insurance			25.0
TOTAL			\$301.1

*standard for all countries

^aArthur D. Little, 1984

APPENDIX VIIIe

PYROMETALLURGICAL PROCESS PLANT IN FLJI

(FOUR-METAL INTEGRATED PLANT)

(OPERATING COSTS IN 1984 DOLLARS)

	\$/unit	units/year ^a	M\$/year
Energy			
Coal	48	1,039,000	49.9
Coke	150*	426,700	64.0
Electricity (kwh)	0.066	1793M	118.3
(bbl) oil #6	30*	390,010	11.7
(bbl) oil #2	34*	12,580	0.4
Subtotal			244.3
Nonenergy			
Lime (t)	75*	124,800	9.4
Limestone (t)	22*	113,900	2.5
Gypsum (t)	22*	367,300	8.1
Electrode materials (t)	400*	14,600	5.8
Sulfuric acid (t)	80*	124,800	10.0
Silica (t)	30*	138,300	4.2
Oxygen (t)	100*	251,900	25.2
Ion exchange (l)	7*	57,000	0.4
Hydrogen sulfide (t)	250*	5,940	1.5
Ammonia (t)	250*	1,020	0.3
Hydrogen (1000 m ³)	150*	3,040	0.5
Nitrogen (t)	165*	15,000	2.5
Subtotal			70.4
Water \$/thous gal	0.50*	3 billion gallons	1.5
Employment (person)	12,437	890	11.1
Maintenance/Taxes/Insurance			25.0
TOTAL			\$352.3

*standard for all countries

^aArthur D. Little, 1984

APPENDIX VIII

PYROMETALLURGICAL PROCESS PLANT IN THE PHILIPPINES

(FOUR-METAL INTEGRATED PLANT)

(OPERATING COSTS IN 1984 DOLLARS)

	\$/unit	units/year ^a	M\$/year
Energy			
Coal	49.5	1,039,000	51.4
Coke	150*	426,700	64.0
Electricity (kwh)	.062	1793M	111.2
(bbl) oil #6	30*	390,010	11.7
(bbl) oil #2	34*	12,580	0.4
Subtotal			238.7
Nonenergy			
Lime (t)	75*	124,800	9.4
Limestone (t)	22*	113,900	2.5
Gypsum (t)	22*	367,300	8.1
Electrode materials (t)	400*	14,600	5.8
Sulfuric acid (t)	80*	124,800	10.0
Silica (t)	30*	138,300	4.2
Oxygen (t)	100*	251,900	25.2
Ion exchange (l)	7*	57,000	0.4
Hydrogen sulfide (t)	250*	5,940	1.5
Ammonia (t)	250*	1,020	0.3
Hydrogen (1000 m ³)	150*	3,040	0.5
Nitrogen (t)	165*	15,000	2.5
Subtotal			70.4
Water \$/thous gal	0.50*	3 billion gallons	1.5
Employment (person)	7,714	890	6.9
Maintenance/Taxes/Insurance			25.0
TOTAL			\$342.5

*standard for all countries

^aArthur D. Little, 1984

APPENDIX IX

COUNTRY RISK RELATIVE TO ITS
PRODUCTION OF MINERALS

Risk Factor ^a	Country	Risk Factor ^a	Country
4.3	United States	5.9	Malaysia
4.4	Canada	6.0	Brazil
4.6	Australia	6.0	Italy
5.0	United Kingdom	6.0	Philippines
5.0	Japan	6.0	Thailand
5.1	Mexico	6.3	Ireland
5.2	Gabon	6.3	France
5.3	South Africa	6.3	Zimbabwe
5.5	Germany, FR	6.6	Bolivia
5.5	Papua New Guinea	6.7	Namibia
5.5	Spain	6.8	Zaire
5.7	Chile	6.8	Zambia
5.7	Indonesia	7.0	India
5.7	Peru	7.0	Jamaica
5.9	Botswana	7.3	Guyana
5.9	Finland		

^aComponents of risk factor: labor, politics, location, quality of mineral resources, country financial and economic performance, energy resources, dependence on foreign natural resources. The higher the risk factor number the higher the overall country risk.

Hargreaves and Fromson, 1983

APPENDIX X

COMPARISON OF ELECTRICITY CHARGES FOR

LARGE CONSUMERS

(BASED ON 50MW AT 90% LOAD FACTOR)

Country/state	cents/kwh 1980	Comments
Australia (as at June 1980)		
NSW	2.3	
Victoria	2.2	
Queensland	3.2	
South Australia	2.4	
Canada		
Quebec	1.5	
New Brunswick (Moncton)	2.4	
Ontario (Toronto)	2.1	
Manitoba (Winnipeg)	1.7	
Alberta (Edmonton)	1.5	
British Columbia (Vancouver)	1.3	
USA		
Texas (Houston)	3.1	
New York (New York)	7.1	
Pennsylvania (Philadelphia)	4.6	
Michigan (Detroit)	3.8	
Illinois (Chicago)	3.6	
Oregon (Portland)	2.1	
California (San Francisco)	4.1	
Tennessee (Chattanooga)	2.6	
Washington (Seattle)	0.5	
Oregon (Bonneville Power Admin. Portland)	0.5	
Ohio (Cleveland)	3.1	
Europe--general	3.1	Average cost for most zinc smelters in 1977
FR Germany	2.8	Widely diverging costs apply to industry
France	3.1 (slack) 6.4 (busy)	Average costs for high voltage industrial use in November 1979

Belgium	4.1	
UK	6.3	
Japan	7.5	
South Africa	3.1	
Brazil	1.5	
Chile	4.0-7.7	
Mexico	1.7	Prices uniform in Mexico, except for 30% rebate applicable in priority industrial zones
Philippines Luzon	4.9	Does not represent total costs
Mindanao	2.5	Probable that insufficient amounts available for a nodule processing plant

Source: Australian Trade Development Council, 1980.

C O N C L U S I O N

CONCLUSIONS

A. Land Use and Environmental Laws

Processing manganese nodules outside the United States is apparently sufficiently attractive to various consortia that several countries have been investigated for such purposes. Among the advantages claimed are proximity to known nodule deepsea beds and lower labor costs. Interview/government officials, Brisbane, December 1983. However, those Pacific Rim/Basin countries with sufficient proximity advantages as well as sufficiently developed (or readily developable) skilled and semiskilled labor forces and infrastructure (power, communications and the like) and port facilities to make such a site feasible also appear to have land use and environmental regulation/impact codes in various stages of development which clearly affect the siting of a manganese nodule processing plant, not only in terms of permit/permission processing time, but also in terms of costs of submission and permission exactions. See, e.g., Bosselman, Feurer and Siemon, The Permit Explosion, 1974; Noble, Banta and Rosenberg, Groping Through the Maze, 1977. It is, of course, true that the cost of complying with various land use and environmental protection and impact laws in the United States is also expensive for the same reasons. The Permit Explosion, *supra*. Moreover, those states which can be expected to be logical sites for a manganese nodule processing plant - California, Washington, Oregon, Hawaii - are those with sophisticated and time-consuming land use and environmental impact laws at the state level, see Healy and Rosenberg, Land Use and the States, 1979; Bosselman and Callies, The Quiet Revolution in Land Use Controls, 1972; Callies, Regulating Paradise: Land Use Controls in Hawaii, 1984; Pelham, State Land Use Planning and Regulation, 1979; Leonard, Managing Oregon's Growth: The Politics of Development Planning, 1981; Washington Land Use and Environmental Law and Practice, by Richard Settle, 1983. Moreover, local zoning is alive and well in all four, and will generally take precedence over any less-restrictive state or regional land use or environmental control. See, Weaver and Babcock, City Zoning: The Once and Future Frontier; Callies, Regulating Paradise, Land Use Controls in Hawaii (1984); Settle, Washington Land Use and Environmental Law and Practice, 1983. Finally, although California's Development Agreements Law Cal. Gov. Code 65864 *et seq.*, does provide a vehicle for local governments to deal with large development projects, only local governments who execute the agreement are bound by its terms, and both the state and federal land use regulations and controls are basically unaffected. See Holliman, "Development Agreements and Vested Rights in California" 13 Urban Lawyer 44 (1981) and Oregon and Washington do not appear to have even so rudimentary a development project expediting statute, see Hagman, "Development

Agreements" 3 Zoning and Planning Law Reports 65-71 and 77-78 (1980). Hawaii is considering a California-like bill presently. None of the above provide for the single-stop permitting provided in Queensland, Australia's Franchise Agreements or, potentially, by INDERENA in Colombia. On top of this heavy load of state and local regulation in our Pacific coastal states, there is of course federal and federally instigated environmental and land use controls through the Coastal Zone Management Act, the Federal Disaster Protection Act, the Clean Air Act, the Clean Water Act, and the National Environmental Policy Act (NEPA), the latter of which both California and Hawaii have state statutory clones. See Callies, Regulating Paradise, Land Use Controls in Hawaii (1984); Bosselman, Feurer and Richter, Federal Land Use Control Legislation 1977.

However, the fact remains that, as this study clearly demonstrates, a consortia seeking to site a manganese nodule processing plant in the Pacific outside the United States on the ground it is more economically viable under Section 102(c)(5) of the Deep Seabed Hard Mineral Resources Act is hardly going to find a regulatory paradise in the areas of land use controls and environmental laws. Every nation surveyed had some measure of planning, land use and environmental law that would apply to the siting of such a plant, although the national government generally had the legal right to act in spite of local government regulations to permit such a project. Moreover, the trend is clearly toward more land use control of industrial development, rather than less. Surprisingly, we found very little "risk analysis" material evaluating the effects of such land use and environmental regulatory constraints despite their clear and obvious impacts on the economics of constructing a nodules processing plant.

What follows is an expansion of the "checklist" of land and environmental regulatory techniques which were prevalent in our study, as summarized in the introduction to this report.

1. Environmental Impact Assessment Requirements

The universality of the NEPA-like environmental impact statement is striking. They exist primarily at the national level, and are either informational or action stopping (more rare) when adverse consequences are disclosed. Thus, the Australian Federal Environmental Protection Procedures require the minister under whose jurisdiction a proposed action will take place to decide whether and to what extent an environmental assessment is required and is then under a (so far unchallenged judicially) duty to take the results of the assessment into account "in matters to

which they relate." Canada's Federal Environmental Assessment Review procedure provides for an extensive review by a specially formed commission for all major projects, though the resulting assessment is only informational. At the provincial level, British Columbia's Environmental and Land Use Act and its Utilities Commission Act both provide for detailed environmental impact assessments which, in the latter instance, can result in the failure of required licensing. The Philippine National Environmental Protection Council reviews environmental impact assessments of projects submitted to it by "line agencies" and is responsible for deciding whether to issue the required Environmental Compliance/Clearance Certificate, though this apparently considerable power is weakened by the authority of the president to grant one if NEPC refuses - which it has apparently never done. INDERENA makes such an assessment based on various required submissions in Colombia. While Fiji does not yet have an environmental impact procedure, amendments to their mining code may soon so provide, though these will probably be inapplicable to a processing plant which does not process Fijian minerals.

2. Substantive Environmental Laws

All six countries surveyed have some substantive environmental laws and/or regulations, ranging from full-blown codes complete with basic pollutant standards to regulations issued under other legislation which are less comprehensive. In the former category are the national air and water pollution codes of both Canada and Australia, the decrees establishing the National Pollution Control Commission in the Philippines, the Law for the Preservation and Control of the Environment in Ecuador and the new air and water pollution codes in Colombia. Examples of the latter are various parts of the public health and water supply codes in Fiji, the national fisheries laws of Canada and the British Columbian Waste Management Act, and the health laws in Ecuador.

3. National Plans

While generally economic/developmental with few direct land use/environmental effects, most nations surveyed had a national plan or planning system under which a project as large as a manganese nodule processing plant would be reviewed. The most land-use sensitive of these national plans is the Philippines Regional Multi-Year Human Settlements Plan 1978 - 2000 and the Blueprints for Desired Development produced by the National Coordinating Council for Town Planning, Housing & Zoning, which set out desired general land uses in every urban and urbanizing region in the country. An example of process type planning at the national level is the Colombian National Planning Department which initially reviews all foreign investment against general planning goals. The same function is performed by the Foreign Investment

Review Agency in Canada. Although there does not appear to be either a national plan or a statewide plan as such, the Premier's Department in Queensland performs a similar functional planning review. Ecuador has a series of policy-oriented development plans administered under the direction of the National Development Council (National Plan for Development, 1980-84). Fiji has all-inclusive regional plans for its urban areas, especially for Greater Suva. Moreover, it has an economic planning review agency for such as a nodules processing plant: the Economic Development Board. It has in addition its Eighth Development Plan for 1981-85 which, inter alia, calls for a system of regional land use planning for regional industrial growth strategy.

4. Local Zoning and Planning

Local plans and zoning ordinances - indeed most local land use controls - are irrelevant in most of the nations surveyed because of the supremacy of national laws in the event of conflict, and the applicability of national rather than local laws to such as a manganese nodule processing plant. This is in sharp contrast to the situation in most of the United States (with the glaring exception of Hawaii which has retained state control over development decisions by vesting in a state Land Use Commission the power to initially classify all land either agricultural, conservation, rural or urban, see D. Callies, Regulating Paradise: Land Use Controls in Hawaii, 1984, where the state-delegated authority to control the use of land through zoning and subdivision laws has been exercised by most local government units, and whose land use regulations generally take precedence over what little state (there is virtually no national) land use controls especially if they are more restrictive. See Weaver and Babcock, City Zoning: The Once and Future Frontier, 1979; D. Mandelker, Environmental and Land Control Legislation, 1976; D. Mandelker, Land Use Law, 1980.

The most sophisticated local land use controls appeared in those countries whose legal systems appear to derive from a combination of British and American law. The former relies heavily on detailed plans as bases for land use control. See D. Heap, An Outline of Planning Law, 1973. The latter, with rare exception relies on land use controls at the local level through zoning and subdivision ordinances only theoretically related to plans for the most part. Babcock, The Zoning Game, 1966. Weaver and Babcock, City Zoning: The Once and Future Frontier, 1979. Those countries with detailed provisions for planning and zoning at the local government level are Fiji, Canada and Australia, followed by the Philippines. Only rudimentary local land use controls were apparent in either Colombia and Ecuador. Each of the first four countries had ordinances at the local level with specific provision for industrial zones in some locations. In the Philippines in particular, detailed ordinances generally appeared

to follow the land use designations in the appropriate volume of the Regional Multi-Year Human Settlement Plan 1978 to 2000. In Suva, Fiji, a detailed zoning map which was keyed to accompanying regulations governed most of the developed portion of that port city, and was administered, appropriately enough, by a British-trained chief planning officer.

5. Project-Specific Development Agreement Laws or Processes

While by no means available in even a majority of the countries surveyed, the availability of a formal and institutional mechanism to deal with all or most necessary approvals and permits for a major development project like a manganese nodule processing plant was one of the unique land/environmental regulatory discoveries of this study. Available by statute in but two U.S. jurisdictions - California and Illinois (and being contemplated by statute in a third - Hawaii) such public-private agreements under statutory guidelines provide perhaps the best opportunity for complete and expeditious processing of major development approval applications.

Although to some extent available in the Philippines "by decree" depending upon economic contribution and "scale" and arguably also in Colombia through the Department of Planning, the best examples are the two processes available to large scale developers in the Australian Province of Queensland. The Franchise Agreement legislation under which is an agreement which is project-specific is the subject of a special act passed by the Queensland parliament.

The process is available where it appears that a project of considerable significance to the province that normal administrative process will unduly delay or even jeopardize it. Less satisfactory from the viewpoint of inclusivity of permitting processes is the Prescribed Project for which infrastructure requirements may place a major burden on the responsible government or where the project is of critical economic significance. Infrastructure is the principal subject of the agreement drawn up under this procedure, and the provincial officer in charge may resolve outstanding permit requirements or remit them to the appropriate agency.

6. Umbrella Agencies

Expedited or simplified permit processes, a land use development goal in the U.S. in many jurisdictions (see Bosselman, Feurer and Siemon, The Permit Explosion, 1974) is clearly manageable under the kind of agreement discussed in the preceding section. It is also possible if a single agency either is responsible for or will obtain or help to obtain, the required

development permits. The latter is fairly common for foreign investors in the countries surveyed: Canada's Foreign Investment Review Board, Colombia's Department of National Planning, Fiji's Economic Development Board, and the Philippines' Foreign Investments Assistance Center provide good examples. The latter partakes of the second type of one-stop permitting agency, since it apparently has the authority to act on any problems concerning the setting up of business by foreign investors, under the executive order creating it. From a natural resource perspective, Colombia's INDERENA appears to have the same authority. If the mining legislation applies to a processing plant not connected with a mining operation in its territory, Ecuador's Department of Geology and Mines could conceivably serve the same function, through the awarding of concessions.

7. Natural Area/Natural Resource Protection Laws

Oddly, the countries surveyed had a relatively undeveloped set of natural area protection law, especially for their huge coastal regions, with the exception of Barrier Reef protection in Australia, and this extends only partially to the land area behind the reef to affect development that might harm the reef itself. The most potentially well-developed is INDERENA's enforcement powers for the protection of the natural environment and resources in Colombia. Such legislation appears to be on the horizon in Fiji. However there does not appear to be any counterpart to the reasonably well-developed coastal zone management and protection program developed at the state and local level in the United States under the auspices of the National Coastal Zone Management Act. To the extent there is regulation of development in coastal areas, it is by the military for strategic or defense purposes, as in Colombia's DIMAR which also controls aspects of new port development. There appears to be the same potential difficulty in terms of development in Ecuador.

8. Port Facilities Legislation

More likely regulation of development comes by means of port authorities or agencies in many of the countries surveyed. Thus, COLPUERTOS in Colombia appears to regulate new development in existing port areas to which it has already been assigned control, though DIMAR, with more military responsibilities, appears to have control over the location of new development on the Pacific coast. The same is true of the port authority in Fiji at Suva, and the Port Authority in Ecuador. In the Philippines, an "application for permit to construct" is necessary from the Port Authority for private port construction activities. It is therefore necessary to look carefully through the laws and regulations of a host country for such provisions among the pages and pages of regulations and laws relating primarily to tonnage, shipping, and the transfer of cargo, which is generally the main duty of port authorities to manage and control.

9. Mining Laws

It was a surprise to find that although most of the countries surveyed had relatively detailed provisions for the construction and operation of smelting and other mineral processing works, none applied by their terms to such plants processing ore from outside the host country, and there seemed little inclination on the part of mining department officials to so apply them. Fiji and the Philippines were perhaps the most salient examples of this phenomenon, with Colombia and Australia right behind. The response in British Colombia was mixed, and officials (but not private attorneys) in Ecuador were certain such laws would indeed apply, if not now, then certainly as proposed to be amended within the next year or two.

10. Native Property Rights

While the right to own property, especially in coastal areas, was restricted with respect to foreigners in virtually every country we surveyed, by and large some sort of lease could usually be arranged if the proposed investment were to be considered in the national interest. While this was also true in Fiji, one aspect of land ownership patterns there, which did not show up in any other country, is likely to show up in other Pacific Basin countries with sufficient frequency that we note it specifically here: inalienable native land rights. While a government-created Commission in Fiji has the apparent legal authority to speak for the Melanesian landholder (which hold between 80 percent and 90 percent of the land in Fiji) the basis for the holdings predates the authorizing law by centuries, and the basis has nothing at all to do with modern notions of jurisprudence, especially with respect to the development or exploitation of real property in the modern sense. It is not at all clear what rights a foreign corporation will have under these circumstances, or whether the native owners will accept a determination made in a court of law which, however much created by a government controlled by their people (as in Fiji) may appear foreign and unjust to them in its determinations.

B. Business and Economic Climate

The historical approach to the evaluation of major minerals processing projects has been to prepare a feasibility study of the project that examines the project's technical and financial elements. The buzz words to senior executives are "what is the bottom line" or in financial terminology, "what is the IRR or NPV" of the project? The acronyms stand for Internal Rate of Return and Net Present Value - widely used measures of project profitability.

The problem is that there are so many uncertainties in forecasting future cash flows from a project that forecasts, particularly in the minerals industry, are usually not very accurate. In addition, "bottom line" analyses often did not include serious analyses of such factors as government attitudes toward foreign investors, political risks, and country economic risks. Expected profits from many projects have dramatically fallen when governments have changed the underlying assumptions, such as increasing taxes, restricting repatriation of profits, restricting imports of necessary equipment and supplies or demanding additional investments in areas that did not meet the investor's profit criteria.

As a consequence during the past decade investors have broadened the basis for analysis of investments - particularly in developing countries. This study attempts to provide useful examples of factors companies are likely to consider in the siting of nodule processing plants. The present study compares the "economic and business climates" of six Pacific countries based on the following four main areas of comparisons: (1) foreign investment attitudes, (2) country economic risk, (3) political risk, and (4) project risk. It is not realistic to combine all four risk areas into one quantified estimate, regardless of arguments to the contrary by some academic analysts.

A more realistic approach is to define the nature and relative level of the risks in 1, 2, and 3 and allow corporate directors to decide whether they are willing to accept these risks in light of the project profitability and risks determined in (4). This approach appears to reasonably approximate the trend in corporate investment behavior. During the field interviews for this study executives would indicate that if country or political risks are too high they simply will not approve investments regardless of the apparent project profitability.

The rankings of the six countries based on the above criteria, placed Australia and Canada at the top with no significant long-term differences between the two countries. Colombia, in spite of its crime problems, appears to be the third best choice followed by Ecuador and Fiji, and in last place, the Philippines. The relatively low ranking of Fiji is not due to government policies and risks, but primarily due to the expected high costs of energy intensive mineral processing plants in Fiji.