

REPUBLIC OF PANAMA

Environmental Impact Study Category II: "Project of dredging and disposal of wastes in the Sector Telfers, Township of Cristobal, district and province of Colón"

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*Environmental
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2.0 EXECUTIVE SUMMARY

2.1 Company General Data

The project sponsor is **PANAMA NG POWER, S.A.**, whose legal representative is **JOSE DAPELO BENITES**, with passport No. C488000. The company is written in the Public Registry of Panama in 674296, 1643967 Document tab.

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2.2 Description of the project; area to develop, approximate budget.

The project is made up of two areas located in the marine area of the Caribbean Sea, a site of dredging and disposal. The dredging site occupies approximately 295,839.53 m² (38.95 hectares) and the provision about 225 hectares, for a total of 254.58 hectares of area of the project. On these sites, will be carried out all of the planned activities, both for the construction phase to the operation phase.

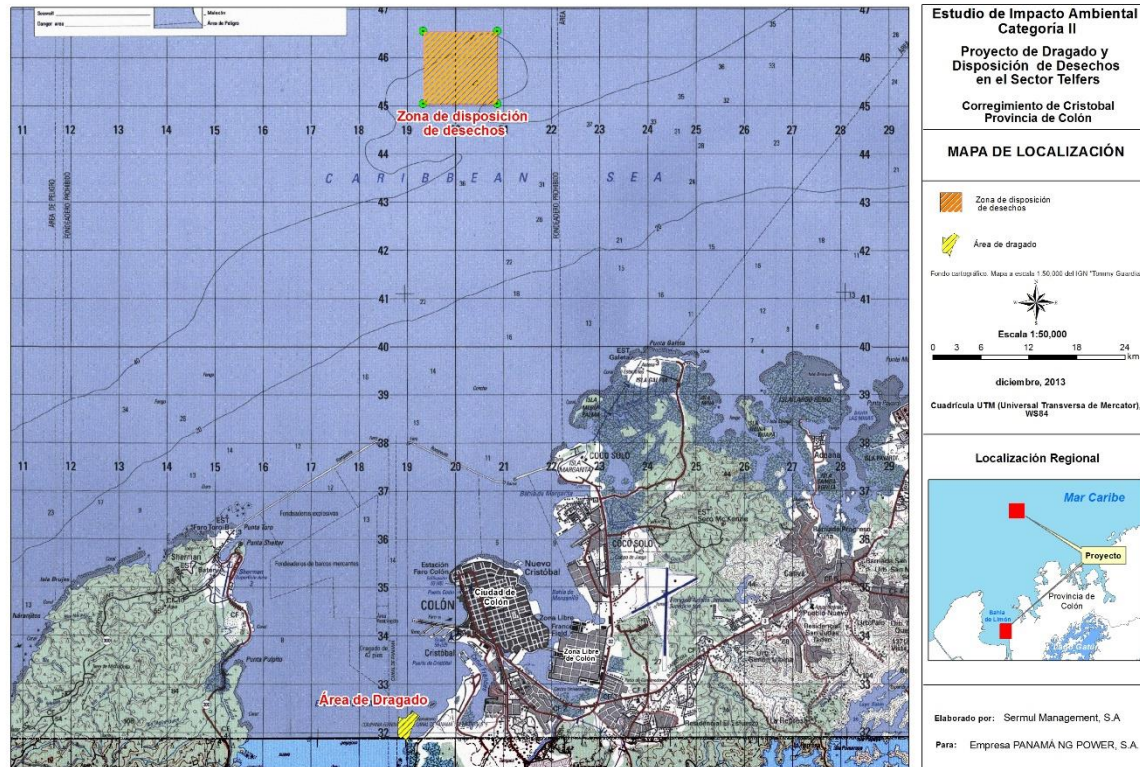


Figure 1.2-1: Location of the Project

The dredging project will be extracted materials currently sedimented, and permanent dredging or maintenance that will extract the re-sedimented after the dredged materials.

The dredging will be carried out through the use of drag hopper dredgers Cutter Suction Dredges, and barges Split.

Hopper dredges by drag consist in a boat with a system of pumps and hoppers where to download the dredged material: This type of dredger removes the material, using dredges, sucks and pumps using a centrifugal pump and deposits within the dredger in hoppers, to finally download it in the areas of provision on land or sea.

N is also measures that must be met prior to the start of work:

Environmental measures for the phase before Dredging

Environmental measures for the phase of dredging.

The project is located with the following coordinates in UTM:

Point 1: 0619319E/1045043N;

Point 2: 0620864E/1045043;

Point 3:0620864E/1046553;

Point 4: 0619319E/1046553N.

In the planning stage, perform a variety of activities, among which we can mention: Collection of existing information, the conduct of preliminary field studies and final designs, studies of current capacity and feasibility of drinking water systems, sanitary service, electrical service and communications, preparation of the Environmental Impact Study and its approval, obtaining all permits with the corresponding authorities.

It is not considered stage of **abandonment** in this project, however, once the construction phase will leave the place totally clear of debris and completely clean.

The project will be developed in two activities: dredging and disposal of material.

According to what is established in the lease and investment, the implementation of the project will be carried out according to the schedule attached.

In the **implementation phase** will require the following staff (skilled and unskilled): Civil Engineer with specialization in health care, Civil Engineer, inspectors, Administrative Staff (Manager, secretary, etc.), Foreman.

The area where the activity of dredging and disposal corresponds to an area where there are already established companies with operations similar to the project.

The estimated investment of the work is of B/. 20, 000,000.00 (20 million with 00/100 balboas)

2.3 Synthesis of the characteristics of the areas of influence of the project.

The stratigraphy of the area of the development of the project, at the top, is characterized by non-consolidated sediments, filled with sand and corals. Underlying in addition, formations of lacustrine sediments¹² (sediments Holocenos), made up mainly of silty sand, silt and organic clays.

The soil has a use similar to the project operations such as Atlantic Pacific, S.A. (APSA) in the storage of fuel from the Atlantic Coast and the PETROPORT with the storage of Liquefied Petroleum Gas which are neighbors of the area selected in the Telfers Island. We also develop activities of the authority of the Panama Canal and Panama Ports Company.

The agrologica capacity in the area of the project, corresponds to soils of class V, VI and VII (according to the classification of the Soil Conservation Service of USA). The project area has traditionally been used for activities related to the adjacent port facilities and distribution of liquefied gas.

The climate that is presented in the study area, is determined by the influence of the oceanic masses, mainly in this case, the Caribbean Sea. The high humidity is an example of this, determining the properties of temperature of the air masses circulating between the oceans. According to the Köppen classification system, of the three (3) Climatic zones that exist in the Canal Watershed in the project area is considered to be tropical wet climate (AWI), which is characterized by a higher average annual rainfall of 2.500 mm, a summer of three (3) months and an average annual temperature between 24° C and 26° C.

The meteorological features of the area of influence of the project, described for the elements:

1 Geological map, Republic of Panama, Ministry of Trade and Industry, Mineral Resources, 1991

2 Geologic Map of the Panama Canal and Vicinity, Republic of Panama, 1980

temperature, precipitation, and wind. This information is useful for establishing basic conditions for the design, construction and operation of the project must have.

The average annual temperature registered is of 26.88° C (80.4° F), with an absolute minimum temperature that goes up to 18.88° C (66° F) between the months of November and December, and an absolute maximum temperature reaching 35° C (95°F), registered in the months of May and October. However, the minimum and maximum averages for the year are located at 24.55° C (76.2° F) and 29.33°C (84.8° F), respectively, which shows a thermal gradient averaged approximately ± 2.4 °C.

In general, the rainy season is beginning in the month of April and ends in the month of november to december; but is mainly concentrated between the months of October and November.

The currents are linked closely to the movements of the earth and the exposure of the oceans to the solar rays. In turn, the sea-atmosphere interaction determines the properties of heat and humidity of the air masses that circulate through the oceans, affecting heavily the meteorology which is manifested on the earth.

The characteristics of the air quality are modified by the presence of sources of pollutants, of which in the project's area of influence, are distinguished only the corresponding to mobile sources of existing landfill and vehicles that circulate in the area and on the access roads.

During the visit in the project area were perceived characteristic smells of the garbage dump located in the area.

The vegetation present in the project area is low, because the site has been acondicionandose for the development of the different stages of other projects.

The current use of adjoining sites of the project corresponds to an area where there are already established companies with operations similar to our project as are Atlantic Pacific, S.A.

(APSA) in the storage of fuel from the Atlantic Coast and the PETROPORT with the storage of Liquefied Petroleum Gas which are neighbors of the area selected in the Telfers Island.

Currently, in the city of Colon and the surrounding area, including the community of Sabanitas, the management system of the wastewater consists basically in the sanitary sewer of the I.D.A.A.N. In the city of Colón and its surroundings, including the communities of Sabanitas, Cativa, Puerto Pilon, Villa Alondra and Cristobal, the management system of the wastewater consists basically in the sanitary sewer system and primary treatment in septic tanks and percolation Imhoff and seagrass beds. The predominant productive activity of the community is oriented toward commercial, industrial, transport, storage.

2.4 More relevant information about the critical environmental problems generated by the project

The project is made up of two areas located in the marine area of the Caribbean Sea, a site of dredging and disposal. The area where the aim is to develop the project is a designated area for industrial use, where there are other similar industrial activities.

In the construction phase of the project for the purposes of the dredging could affect the landscape. Affected the air quality in the construction stage by contamination with dust, produced by the movement of soil and traffic of heavy equipment, and for possible bad smells at the same time you are danto the movement of the seabed for the dredging; however, at the stage of operation does not adversely impact the quality of surface water or groundwater or aggressive emissions to the environment.

In the case of the provision, in the area that has been designated to depose the waste, will have impacts on the management of solid waste product of dredging, however will not be the same importance.

2.5 Short description of positive and negative impacts generated by the project

The potential **positive impacts** are: employment generation, improvement of the quality of life of the population, development and intensification of economic activities, increase in the value of the land uses compatible with the territorial planning.

The following are the possible **negative impacts** that can be generated in the middle by the actions of the project.

Table 2.5-1: Possible negative impacts

Potential Impact	Description
Changes in the quality of the sea water in the area of dredging and disposal site material.	During the process of dredging occurs a re suspension of particles that negatively affect the quality of the sea water, increasing the turbidity and consequently to benthic and pelagic species. At the site of dredging, the contribution of new material also creates a temporary increase in turbidity, altering the quality of the water in the area.
Damage to the bodies of the fund	The dredging removes the agencies associated with the Fund, especially to benthic species of little displacement. At the site of the disposal of dredged material occurs a peculiar situation as the new material to be incorporated into the substrate and "fall" on the bodies of the area may directly affect species, especially the sessile.
Alteration of the benthic habitat in the area of dredging and disposal site material	In the area of dredging the material or the bottom sediment will be removed, completely eliminating the existing habitats, habitat alteration a acarrando, regardless of the animals who are residents of the same. In the disposal site of the material, the habitat is covered by new sediments, which directly affects the morphology of the benthos, depending on the volume of downloaded material.
Affectation to pelagic organisms	The anthropogenic activities affect to a greater or lesser degree pelagic organisms. During the dredging these tend to move away from areas of high activity, while at the site of the disposal of material can be affected by the mechanical action of particulates which alter their environment.
Resuspension of sediments and turbidity	During the dredging and discharge of dredged material bottom sediments are mechanically removed and suspended in the water column. Heavier sediments quickly settle, but the fine sediments, clays and silts remain in suspension and these are transported by

Potential Impact	Description
	the currents and swells covering large areas and generating turbidity, and increasing the concentration of suspended solids, surpassing the natural condition.
Changes to the bathymetry of the area dredged and download zone	The alterations of the seafloor topography causes an increase of the depths of the channels generating changes in the cross-sectional, longitudinal profiles and formation of dunes or promontories can modify the flow pattern of the affected area.
Alteration in the hydrodynamics	This impact occurs with increasing depth and formations of channels and training of Promontories
Alteration of the quality of the waters	Would correspond to a variation of physical-chemical concentrations that have the waters with respect to the base line, due to the movement of earth and rock, loading and transport of materials, movement and operation of equipment, machinery and vehicles, waste management, use and management of hazardous substances or contaminants. These actions can produce the contribution of pollutants by inappropriate practices or accidental spills.
Risk of damage to the fauna, by the levels of noise generated	This impact would be submitted when the elements of the fauna present in the project areas and its surroundings, are affected in their habits due to an increase in the levels, frequencies and durations of noise. This can affect the habits, migration, reproductive rights, among others.
Risk of accidents	Would consist in the possibility of a worker suffering a certain damage resulting from their work activity. Are considered diseases, diseases or injuries with reason or on the occasion of the work.

Source: Prepared by the consultant. 2013

2.6 Description of mitigation measures, monitoring, surveillance and control provided for in respect of each type of environmental impact identified.

The following are recommended mitigation measures:

Measures for the Control of the Dispersion of particles of sediment (Site of dredging and disposal site)

Although it is very difficult to establish a mitigation measure are listed some recommendations.

- Efficient use of a low invasive dredging equipment. You must use a hydraulic dredger. The suction dredge for drag, is Split type (opening to the east) or with Gates of Fund is the most appropriate alternative for the dredging.
- Use the Protocol available through default m 200 cells and determine the initial point of discharge, by in situ verification, as well as its dispersion.
- To characterize the physico-chemical oceanographic conditions and during a spill weekly and set control points in nearby areas. Modeling the pen of turbidity.
- Ensure that the disposal of dredged material is carried out in accordance with the quadrants established within the disposal sites, checking the position of the coordinates of each quadrant through the use of a GPS.
- Ongoing coordination of the activities of dredging and disposal, to prevent the discharge of dredged materials fine during the occurrence of adverse weather conditions.
- Implement the measures for the control of the deterioration of the quality of sea water, corresponding to the turbidity.
- Implementation of the Plan of monitoring of the quality of marine water and sediment.
- To optimize the speed of sucking and pumping of dredged material
- Establish a program of permanent control of the use and maintenance of the equipment to be used in the dredging, so that there is no leakage or loss of fuel or lubricants. The maintenance program for the team must ensure the operation of the equipment in an efficient manner and without any leaks.
- Fuels and lubricants must be disposed of in suitable containers. In addition, the greasing, supply and transfer of fuels and lubricants in open sea shall be carried out by trained personnel to meet the standards of environmental quality for waters. Collect and recycle the lubricants and greases during and after the actions of maintenance dredging equipment, complying with the Law 6 of 2007.

- All wastes that are generated during the dredging, must be collected, deposited in punches and transported to the landfill.
- Do not discharge ballast water, waste or throw solid waste to the sea.
- To implement the norms and conventions (MARPOL 73-78) to reduce marine pollution by oil spills
- Train staff on issues related to spills and accidents with substances such as fuel or lubricants;
- Dispose of absorbent oil and floating barriers to avoid short-term the dispersion of hydrocarbons in the water.
- Apply the technical requirements for the implementation of dredging works in accordance with the Panama Maritime Authority (AMP);
- Comply with what is established in the 35-2000 DGNTI-COPANIT Standard on Water, Liquid Effluent Discharge directly to bodies and bodies of surface water and groundwater, continental and maritime.
- Implement the plan for monitoring the quality of the marine water and sediment.
- Implement measures of monitoring, surveillance and control such as visual inspections and periodic monitoring of the water quality of both at the stage of construction and operation.

Measures to control the spillage of Dredged Material During Transport

- Mark a safe path for the transport of dredged material to the disposal site material.
- Do not overfill the transport equipment of dredged material;
- Inspect and give frequent maintenance to the system of floodgates to drain, to ensure their proper functioning;
- View from the deck of the barge, the possible loss of dredged material by overflow from the tub of containment during the transfer of the same;
- To ensure, through the use of a GPS, that sediments are deposited within the designated as final disposal site and not outside of it;
- Check that the Out of disposal sites, after depositing the material, the floodgates are properly closed

- Carry out a bathymetry of the dredging area and the final disposal site once the dredging activity;
- Comply with what is established in the 35-2000 DGNTI-COPANIT Standard on Water, Liquid Effluent Discharge directly to bodies and bodies of surface water and groundwater, continental and maritime and
- Implement measures of monitoring, surveillance and control such as visual inspections and periodic monitoring of the quality of the water.

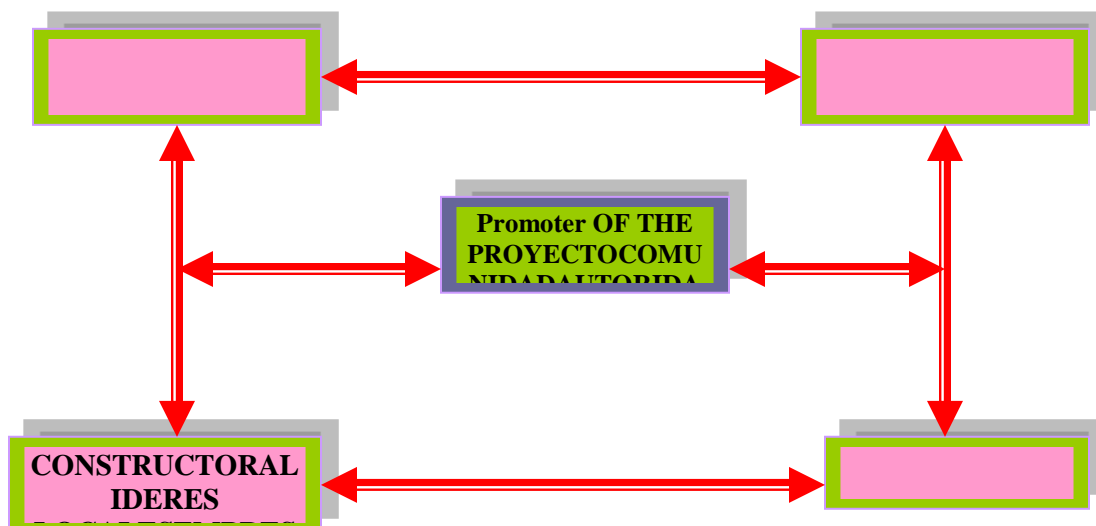
2.7. Description of the citizen participation plan.

Depending on the scope of the Executive Decree 123 of 14 August 2009, in its Chapter II: The Citizen Participation Plan, Article 30, we describe as developed by the consultant team in this area.

A. Identification of key actors within the area of influence of the project, work or activity (communities, authorities, organizations, community boards, environmental advisory councils, other).

The actors involved in the project which is the subject of study, can be clearly observed in the scheme below.

Figure 2.7-1: Actors involved in the study



The relationship that must exist between the different actors involved in the implementation of the project is broadly reflected in the figure. This implies a close relationship between the different actors, which allows an absolute communication and trust between them, which ensures continuity of the project. The fundamental actor of the work, is identified with the community to avoid misunderstanding and mistrust.

B. Participation techniques employed to key stakeholders (surveys, interviews, workshops, assemblies, meetings, etc.), the results obtained and its analysis.

Within the participatory techniques employed, we have the implementation of survey, informal interviews. Everything was led by a document attached in Annex N° 6. The results in our view were satisfactory and can be seen clearly in point 8.3 (local perception on the project, work or activity (through the Citizen Participation Plan). An objective analysis of the results of the Plan of participation, the acceptance of the work but, with some apprehensions that are no more than a reflection of lack of information and domain on the subject of the work proposal.

C. Techniques of dissemination of information employees. Given the complexity and dominion of the topic to be discussed, was used as the diffusion technique, the open conversation. This allowed a direct relationship with the main actors of the project. This

discussion was allowed in the first place, trust between them and, on the other hand, a comprehensive explanation of the scope of work proposal for its development. In the annex is an informative document of Notice of Public Consultation, which was used as a guide to inform the community about the scope and development of the work proposal.

D. Information request and response to the community. One of the concerns presented by the community is the contamination of the environment, fauna, flora and people. If it is true, was expanded in some way the explanation of the scope of the work, it is recommended that the implementation of alternatives that permit the increase, to the extent possible, the degree of knowledge of the community on the proposed project. This will help to avoid any disagreement about the project, once the implementation of the same. This is the best means of responding to the requests for information and response to the same.

E. Contributions of key actors. For the phase that involved the community in the Citizen Participation Plan, one of the greatest contributions, was offered by the consultant team. The contact between the two sides, cleared my doubts with the daily live and evolve in the area you have chosen to run the project. In the analysis of point b (participatory techniques employed to key stakeholders (surveys, interviews, workshops, assemblies, meetings, etc.), the results obtained and its analysis), with clarity, the latent concern of the inhabitants of the area of influence of the project and the mechanisms that the consultant team poses to settle the differences indicated by them.

F. Identification and resolution of possible conflicts generated or strengthened by the project. A fundamental aspect that must be considered by the managers of the work, is to maintain a direct and permanent communication with the community, so that if it were ever to be some inconvenience, this can be remedied by means of dialog and understanding between the parties. It is advisable and prudent, provide all possible opportunities to those who express affectation or disagreement around the project, as well as delivering answers that satisfy the nonconformity of the affected.

To occur some incident in this regard, we must not lose sight of the three fundamental characteristics for the resolution of conflicts and which we quote below: Focus the dispute to apply a solution, the negotiations must be based on the interest and can be supported with the existence of a third of impartial type.

It is the responsibility of the Company, strict compliance with the agreements established with the Community, prior to the start of the construction of the work or any that may arise during the process or when it is to start operations. This will help to ensure the strengthening of the relations that should prevail between the Community and the promoter of the project.

2.8. Sources of Information Used

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