

1. Introduction

This section presents the environmental component of the Technical, Economic and Environmental Feasibility Study – EVTEA for the lease area **STS08**, intended for the handling and storage of liquid bulk (especially petroleum by-products), located in the Port of Santos Complex.

This preliminary environmental study aims at supporting an evaluation of relevant environmental aspects associated with the development of port leasing activities in the Alamoia region. The study evaluation bases its estimates on conclusions using the following sources: studies previously carried out for this area, the current occupation situation of the area and its surroundings, environmental licensing situation of the port/leasing area, on-site field surveys, proposals for future occupation and future operation of the terminal, and the applicable environmental legislation. The study's review of compliance with existing environmental law covers the following topics:

- Description of the rental area;
- Environmental licensing;
- Document analysis and technical visits;
- Definition of the environmental study necessary for adequate licensing;
- Assessment of potential environmental liabilities;
- Identification of main environmental impacts;
- Proposition of environmental programs;
- Management of contaminated areas; and
- Pricing of environmental costs.

Based on these evaluations, the study lays out the likely pathway for acquiring the terminal's environmental licenses. The study also discusses environmental control and management measures to be required during and after the licensing process. Moreover, the study also evaluates the possible compensatory measures that new lessee might have to undertake. Lastly, the study provides costs estimations associated with the licensing process and environmental management.

2. Description of the Rental Area

STS08 is located in the Alamoia region, within the city of Santos, part of the State of São Paulo. Navigation wise, the area lies on the right bank of the navigation channel of the Organized Port of Santos.

The region surrounding **STS08** is flanked by vegetation and the navigation channel to the north, other liquid bulk terminals to the south and vegetated areas to the west.

Currently, the existing lessee handles petroleum by-products, including LPG. The operation is under the responsibility of Transpetro, a Petrobras subsidiary. In essence, STS08's area will be a subset of the existing terminal, covering a total area of 152,324 m².

According to information provided by the Port Authority (not Transpetro), the Terminal's water supply is bought from the local water company (Sabesp). As for electricity, the terminal is connected to Companhia Paulista de Força e Luz – CPFL's distribution network. The terminal's sewage system is an unusual situation, as sanitary liquid effluents are treated at the Sewage Treatment Plant - ETE inside the area itself, before being released into the local body of water (estuary). The Terminal's right to properly dispose of its sewage was granted by the State of São Paulo's Department of Water and Electricity, under its special grant program. Finally, to verify the Terminal's compliance with quality standards for sewage disposal, a parametric analysis must be performed regularly, as set forth by CONAMA's Resolution No. 430/2011 and State Decree No. 8,468/1976.

Section F - Environmental

It is worth noting that the study did not plan for the construction of a new treatment plant for **STS08**, so Terminal STS08A and **STS08** will have to share the existing ETE plant. The plant itself will be located within STS08A's area.

According to engineering studies for the area, terminal **STS08** will ensure that operations (storing and handling of petroleum by-products) are not interrupted during transition. Meanwhile, the Terminal is also expected to meet additional demand by expanding its storage and handling capacities. Section C - Engineering details assumptions used in formulating **STS08's** future structures.

3. Document analysis and technical visit

The methodology for evaluating this area of interest is based on compilation, systematization, and analysis of available environmental information. In sourcing its material, the study follows the process below:

3.1. Document analysis

- Relevant Environmental Legislation;
- Conditions to environmental licensing of the port and the lease, if any;
- Recorded Documents of mapped environmental liabilities;
- Studies and documents prepared for the Terminal and port, such as: Environmental Study, Conduct Adjustment Term - TAC, Environmental Audit Report, Existing Environmental Licenses and Authorizations, Environmental Plan and Program reports, Annual Environmental Information Report - RIAA, among others;
 - Relevant environmental information (Conservation Units, Permanent Preservation Areas, Historical and Archaeological Heritage, Indigenous Lands, Traditional Communities, *Quilombolas*);
 - Prior evaluation of recent satellite images to verify possible conflicts with other activities or occupations in the surroundings;
 - Temporal evaluation of the area by means of satellite imagery.

3.2. Technical Visit

- Evaluation of existing structures and the collection of evidence of potential contamination or environmental non-conformities;
- Visual evaluation of the surroundings of the area of interest: during the technical visits, the team performs a visual evaluation of the surroundings, aiming at identifying adjacent activities that may affect or present potential risks to the environmental quality of the area. This inspection also aims at identifying whether activities developed inside the area have impact on the surrounding environmental quality;
 - Interviews with people familiar with the historical operation in the area; and
 - Contact the following authorities to collect environmental data and information necessary for completing this report:
 - Local port authority;
 - Parties Responsible for the administration of the Terminal.

3.3. Environmental Information for area STS08

Table Table 1 presents the documentation available to EPL, in November 2019 and September 2020, regarding the situation of the environmental licensing, including its certifications of the Terminal, and the Port of Santos.

Section F - Environmental

Terminal Documentation	Issuing Body	Object	Date of Issuance	Validity
LO No 18002881	CETESB/SP	Pipeline Transportation	01/23/2018	04 years
LO No. 1,382/2017-Rectified (granted to SPA)	IBAMA	Organized port of Santos, including waterway protection and access infrastructure, as well as dredging operations	-	05 years
Certificate No. BR032332	Certification Bureau Veritas	ISO 9.001:2008	07/05/2019	07/04/2022
Certificate No. BR032334	Certification Bureau Veritas	ISO 14.001:2004	07/05/2019	07/04/2022
Certificate NO. BR032333	Certification Bureau Veritas	OHSAS 18.001:2007	07/05/2019	11/03/2021
Neighborhood Impact Study - EIV	INERCO/TRANSPETRO	Preparation of EIV - Santos Waterway Terminal - SP	06/14/2019	-
Remediation Completion Report	PETROBRAS and ESTRE Ambiental	Santos Waterway Terminal - SP - Tank Storage Area 301	12/01/2016	-
Master Plan SANTOS PORT COMPLEX	MINFRA	Support in the Planning of the National Port Sector	Feb/2019	-
Santos Zoning Development Plan - 2012-2024	Port of Santos/SEP/MINFRA	Strategic planning of the occupation of public areas	Jul/2020	-

Table 1: Evaluated documentation for area **STS08**.
Source: Own, based on collected information (2019).

It is worth noting that the current LO does not include the complete area planned for Terminal **STS08**, with the responsibility of ensuring the issuing of the new license falling to STS08A.

The following Figure presents the approximate delimitation of the area currently leased to Transpetro.

Section F - Environmental



Figure 1: Delimitation of the area currently leased to Transpetro.
Source: SPA.

The study prepared its preliminary diagnosis for this area while analyzing the following sources: the on-site verification, interviews conducted on 16 and 17 September/2019, information from Public Hearings on **STS08**'s lease process and meetings held in September/2020 with SPA. Based on this information, the study's conclusions are found below:

- Existing structures and evidence of potential contamination or environmental non-conformities:

According to documents provided by the Port Authority, it was found that part of **STS08**'s area was as temporary waste storage. Consequently, in accordance with CETESB's Board Decision No. 038/2017/C, Transpetro hired an investigation service to survey the area for contamination. It is worth noting that this Particular board decision establishes new "Procedure for the Protection of Soil and Groundwater Quality", revises "Procedures for the Management of Contaminated Areas" and establishes "Guidelines for Management of Contaminated Areas under Environmental Licensing".

- Visual assessment of surroundings, potential risks to the environmental quality of the area or surrounding area:

The region surrounding **STS08** is flanked by vegetation and the navigation channel to the north, other liquid bulk Terminals to the south and east as well as vegetated areas to the west.

There are potential risks to surrounding areas due to handling/storage of liquid bulk (various chemicals), mainly due to the risk of possible leaks.

Section F - Environmental

- Interviews and technical meetings

In interviews with those in charge of the administration of the Organized Port of Santos, the study acquired relevant documents related to the current lessee's activity. The information gathered by the team allowed us to have a clear view of the environmental situation in the area of interest.

4. Environmental Licensing, Definition of Licenses, and the Environmental Studies Necessary for Acquiring a License

This topic aims to clarify the guidelines for acquiring and maintaining an environmental license. More specifically, the topic elaborates on the licensing process for the specific type of enterprise that is the subject of this viability study.

Hence, regarding the type of environmental license that will be necessary for operating **STS08**, the study based its conclusion by analyzing the following items:

- Environmental agency responsible for environmental licensing;
- Current situation of the area;
- Activities currently performed in the area;
- Operational and structural changes proposed for the area;
- Existing environmental license;
- Legal framework.

As described in Section C, the study designed a transition phase, aiming at safeguarding the operational continuity of terminal. This section sets out the objectives of the first transition stage below:

- I. Consolidate existing operations under **STS08A**, guaranteeing a smooth transition by allowing the new lessee to run a set temporary areas; and
- II. Storage capacity expansion in the then undeveloped areas that are now part of Terminal **STS08**;

Below are the objectives for the second transition stage:

- I. Complete the capacity expansion of STS08 in areas that were provisionally managed by **STS08A**; and
- II. Expansion of Alamoia berthing system by building a new pier (2 additional berths).

Based on this information, it was possible to define the most appropriate environmental licensing strategies for the area, as follows.

Regarding handling and storage operations, the study concluded that **STS08**'s licensing status is partially regular. Specifically, according to Operating License (LO) no. 18002881, the Terminal is currently allowed to "handle and store oil, its products and ethanol in the Santos Waterway Terminal. However, the authorization is contingent on adequacy "of buildings and equipment contained in plant DE-4300.27-6210-911-PTP-001".

It must be emphasized that the area regulated under LO no. 18002881 covers **STS08**'s storage tank areas. However, during the transition phase, these tanks will be provisionally managed by **STS08A**. Hence, requesting the transferring of this larger LO to **08A**, serves the objective of avoiding interrupting existing operations. In essence, the LO-covered section will be operated for 3 years by terminal **STS08A**. The remaining area is not covered by any license. To be clear, the existing LO does not distinguish between terminals, covering what is going to be divided into **STS08** and **STS08A**.

Section F - Environmental

Regulatory wise, the licensing of Area **STS08** is the responsibility of the Environmental Company of the State of São Paulo - CETESB /SP. The study assumes that this agency will continue to be the relevant body in charge of licensing in the state. Thus, the study followed CETESB resolution and procedures in relation to developing a licensing strategy for **STS08**.

In short, the Terminal can be classified as a brownfield asset that is currently under partial operation. In addition, as the study currently stands, there are several improvements and expansions planned to its existing structure, including storage tank expansions and the new Railway Access.

Thus, with the objective of implementing new structures in the currently unlicensed area, as described in the 1st Transition Stage contained in Section C – Engineering of this EVTEA, the new lessee will have to proceed with the ordinary, three-phase licensing process, encompassing the acquisition of prior, installation and operation licenses (LP, LI and LO).

The following figure shows the 1st Transition Stage of the Terminal, with 3 years of duration.



Figure 2. 1st Transition Stage of **STS08**.
Source: EPL (Section C).

With the intent of achieving the objectives of continuity discussed above, is this study's view that the Prior License (LP) and the Installation License (LI) will have to be applied for during the first year of the lease. In addition, CETESB will have to have granted authorization for the terminal to operate its new facilities (LO) by the beginning of the fourth contractual year.

Section F - Environmental



Figure 3. 2nd Transition Stage STS08.
Source: Source: EPL (Section C).

One of the challenges of acquiring a Prior License (LP) is correctly selecting environmental studies that can support the issuance of licenses. With that in mind, in selecting the best study, this section considered the following points: the terminal's area characteristics, its intended operation, insights from SMA Resolution No.49, of 05/28/2014 that sets forth CETESB's environmental licensing procedures and other legislations. Hence, given that the scope of intervention that include tank capacity expansion, the study assumes that a simple "Preliminary Environmental Report – RAP" will suffice.

The recommendation is that two environmental permits be obtained, the first one for the implementation of the new tanks and the second one for the implementation of the railway access. The reason is that these two areas have different environmental sensitivity levels. More specifically, the Railway Access will be built above a mangrove forest, a fact which could strongly influence the period of time to obtain the permits for this area. Thus, the preparation of a Preliminary Environmental Report/PER for each area must be considered. However, the Basic Environmental Program/BEP must encompass the entire terminal, including the Railway Access.

It is important to point out that the processes to obtain the two Permits can be combined into one process, in which case only one environmental permit will be issued for the entire project.

Furthermore, considering the incorporation of undeveloped areas under **STS08**'s area for the tanks and for the Railway Access, CETESB will likely require a permit to remove the vegetation. It will be necessary to prepare Vegetation Characterization Reports, such reports to be part of the Preliminary Environmental Report under the terminal's PBA.

Finally, the new lessee will also have to comply with relevant municipal legislation impacting the implementation of the project. In particular, this section highlights Complementary Law No. 793 of January 14, 2013 and its amendments (Complementary Law No. 869 of December 19, 2014 and Complementary Law No. 916 of December 28, 2015) from the municipality of Santos. Indeed, the law requires that an additional study referred to as Neighborhood Previous Impact Study – EIV be carried out, as defined in Art. 9, item V below:

Section F - Environmental

"Art. 9 ° Neighborhood Previous Impact Study - EIV will be mandatory for undertakings or activities listed in Annex I of this supplementary law, in the following cases:

V – To get approval for a project which entails renovation, for a project that adds an area to existing or new areas, or for regular and compliant activities related to the use of shopping malls, hypermarkets and retail sellers, universities, convention centers and trade fair pavilions/exhibitions, wholesale traders and port and /or retro port activities, provided that the increased area exceeds five percent (5%) of the existing area, regularized prior to the publication of this complementary law, considering the cumulative amount for the calculation of reported percentages; "

Although Transpetro has already met this requirement, in view of the new proposals for the lease and future facilities in **Terminal STS08** (in addition to a possible change of lessee), the study assumes that a new EIV will have to be presented to the City of Santos. Consequently, the new lessee new may face additional mitigating and compensatory measures related to the new area.

In **STS08's** environmental licensing process, in addition to interfacing with CETESB, the new lessee may have to interact with other stakeholders such as Port Authority, Navy, and among others agents that may have material concerns regarding the Terminal's environmental impact. Thus, given the impracticability in mapping all these possible conflicts, such a comprehensive analysis remains beyond the scope of this study.

The following table presents a conceptual summary for ensuring compliance with environmental licensing process:

#	Type of Occupation in the Port Area	Type of Study	Environmental Licenses
1	Partial Operating brownfield area	Preliminary Environmental Report/PER for the tanks, and Technical for the ASV PER for the railway access and Technical for the ASV Neighborhood Impact Study - EIV	LP
2		Basic Environmental Program - PBA LP Conditioning Report	LI e ASV
3		Compliance report for LI and LO Conditions	LO

Table 2: Characteristics and typology of environmental studies and licenses - **STS08** area.

Source: EPL

With regard to the possibility of environmental compensation, to which Federal Law No. 9,985/2000 applies, CETESB will define whether or not it will be necessary to require environmental compensation from the enterprise. It is important to mention that there is no term of commitment regarding environmental compensation related to Terminal **STS08**.

5. Assessment of Potential Environmental Liabilities

An environmental liability shall be recognized as such whenever the company has the obligation to incur costs with environmental actions related to relating to recovery, restoration, closure or removal. Upon becoming aware of the liability, the business must notify the agency so that the necessary actions can be carried out.

Section F - Environmental

The evaluation of potential environmental liabilities is the result of document analysis and information obtained through technical inspection in the area of interest, as presented in item 3 - Document Analysis and Document analysis and technical visit

Regarding the investigation of potential liabilities in area **STS08**, the study collected the following information, evidence and/or indication of conflicts between this area and its surroundings:

- Technical survey of the area in 2019: evidence of potential contamination or environmental non-compliance.
- Analysis of independent third-party data on the surveyed area, focusing on possible signs of contamination.

Regarding classification standardization of environmental liabilities related to contaminated areas, the study observed the assumptions in CETESB Board Decision 103/2007/C/E/2007. It is worth noting that this Decision is in line with CONAMA Resolution No. 420/2009, Abnt Standard NBR 15515-1/2007: Environmental Liability in Soil and Groundwater – Part 1: Preliminary Assessment and the North American Standard *ASTM E 1527-05* Environmental Site Assessments: Phase I Environmental Site Assessment Process. Thus, according to the aforementioned methodology, the following definitions may apply to the study area:

- **Potentially Contaminated Area (PA):** These are the areas where potentially contaminating activities are being or have been developed, i.e., where the management of substances whose physical-chemical, biological and toxicological characteristics occurring or occurred, can cause damage or risks to human health and other protected assets;

- **Suspicious Contamination Area (AS):** These are the areas in which, after carrying out the Preliminary Environmental Assessment, there is evidence that supports suspicion of the existence of contamination in the area or its surroundings;

- **Contaminated Area under Investigation (AI):** These are areas where there is evidence of the presence of contaminant products, or when there is a finding of substances, conditions or situations that, according to specific parameters, may pose danger to the environment;

- **Contaminated area (CA):** area, land, site, installation, building or physical improvement, previously classified as contaminated area under investigation (AI), and, after conducting risk assessment studies, the amounts or concentrations found cause or may cause damage to human health.

- **Rehabilitated area for declared use (AR):** area, land, site, installation, building or physical improvement, previously classified as an area under monitoring for rehabilitation (AMR) that, after final monitoring was conducted, is considered fit for its declared use.

- **Area Excluded from Registry:** These are areas that, based on the findings raised in the Preliminary Assessment, do not present enough evidence of danger. Thus, such areas would not be reclassified as Potentially Contaminated (PA).

In conclusion, in view of the information collected and relevant standards of classification, the **STS08** falls into the **Potentially Contaminated Area (CA)** category.

According to Port Authority documents, this study found that part of **STS08's** area was as temporary waste storage. Consequently, in accordance with CETESB's Board Decision No. 038/2017/C, Transpetro hired an

Section F - Environmental

investigation service to survey the area for contamination. It is worth noting that this Particular board decision establishes new "Procedure for the Protection of Soil and Groundwater Quality", revises "Procedures for the Management of Contaminated Areas" and establishes "Guidelines for Management of Contaminated Areas under Environmental Licensing".

In any case, assuming that this lease will follow the same risk allocation framework as previous ones, any past liability that was not mapped by the government before the transfer of the area to the new lessee is the responsibility of the government. The only constraint to this rule is that the unmapped liability must be brought to austeritý's attention within 360 days of the official transfer of the area.

6. Possible Social and Environmental Impacts

In view of the brownfield nature of the area and its planned investments in storage tanks, the relevant environmental impacts that should be managed during the investment implementation stage include: atmospheric emissions, noise and vibrations, release of liquid effluents, generation of solid waste, and etc. To address those impacts, the study assumes the implementation of actions and measures that represent best environmental practices for mitigating this type of investment risk.

Positive impacts were identified, such as the direct generation of jobs, which will increase employment opportunities and income in the region, increased production capacity, higher tax proceeds, and increase in municipal and state economic activity.

The following table lists the main socio-environmental impacts related to intervention in **STS08**.

Impacts	Phases	
	I	O
Generation of solid waste and liquid effluents	X	X
Air pollution	X	X
Sound pollution	X	X
Proliferation of harmful synanthropic fauna		X
Change to and disturbance of the population's daily life	X	X
Incompatible practices of workers involved in installation and operation	X	X
Risk of accidents with hazardous dangerous products	X	X
Soil contamination and waterproofing	X	X
Change in soil and groundwater quality	X	X
Change of local flora	X	

Table 3: Impacts related to Investment implementation (I), operation (O) phases of **STS08**.

Source: EPL, based on the characteristics of the area of interest.

6.1. Generation of Solid Waste and Liquid Effluents

The main solid waste generated in the port terminal operation process should be included in classes I or II of NBR 10.004/2004:

- **Class I - Hazardous;**

Section F - Environmental

- **Class II - Non-hazardous**

The waste considered as Class I - Hazardous - is generated in the processes of preventive and corrective maintenance of critical equipment. Such activities generate harmful residues, such as oily waste, broken lamps, building maintenance waste, alkaline batteries, and others.

Waste classified in Class II is non-polluting and may be inert or non-inert, such as food waste, paper and cardboard waste, wood waste and textile materials, among others.

Effluents generated during the terminal's activities include domestic sewage, rainwater and possible oil leaks/spills from machinery and equipment. Thus, in essence, the risk of contamination lies in possible leaks, and the terminal is responsible for taking the necessary steps to prevent and control such risk.

6.2. Air Pollution

Higher level of air pollutant emissions is likely to occur in the investment implementation phase and during operation. Particularly high levels of emission should be expected from machinery operation and maintenance vehicles.

In addition, during the implementation and operation of the Terminal, atmospheric emissions from fossil fuel-machinery and equipment occur, in addition to other volatile gases' emissions.

6.3. Sound pollution

During the terminal's investment implementation phase, noise levels are expected to increase, especially those related to the operation of machinery and maintenance vehicles.

6.4. Proliferation of Harmful Synanthropic Fauna

Terminal activities can generate accumulation of organic residues and favorable conditions for the proliferation of pests and vectors, including mosquitoes, cockroaches and rats.

6.5. Changes to and Disturbance of the Daily Life of the Population

The lack or failure in communication between the players involved in the execution of the enterprise, with emphasis on the lessee, port authority, workers, municipality and the community, increases the possibility of disturbances, and may cause negative impacts on the implementation and operation of the terminal.

Another relevant impact for this study is the recurrent flow of people at the terminal itself. Indeed, human traffic may be particularly intense during recruitment phase, resulting in changes to the daily life of the population, especially local residents.

6.6. Incompatible Practices of Workers Involved in Installation and Operation

Lack of training for the workforce involved in the implementation of investments and operation of the terminal may incur in the following negative impacts: disruption to the terminal's day-to-day operation, fail to implement socio-environmental programs, worsening of the relationship with the surrounding population, and health and safety risk of those involved.

6.7. Risk of Accidents with Hazardous Products

Any accidents involving the storage and transportation of dangerous products can affect the users of the terminal, the neighboring populations, and the environment.

The risk of contamination lies in possible leaks, and the terminal is responsible for taking the necessary steps to prevent and control such risk.

6.8. Soil Contamination and Waterproofing

Soil contamination occurs by infiltration of water from the flow of highly waterproofed and contaminated surfaces. Thus, to mitigate impacts soil contamination, best environmental practices favor the installation of resized rainwater drainage system wherever there is asphalt or cement surfaces. The consequences from contamination and destabilization channel banks facilitates the accumulation of harmful wastes risking poisoning streams/groundwater that communities rely on to sustain their populations.

6.9. Change in soil and groundwater quality

The Terminal's investment implementation and operation may be detrimental to the quality of water in the region, including the potential for contaminating the community's groundwater.

The effluents generated in the Terminal's activities are related to domestic sewage, rainwater and possible leaks and spills during operations in the Terminal and can contaminate soil and groundwater.

6.10. Change in local flora

The removal of vegetation for the planned implantation of the Terminal's structures is likely to bring changes in the flora of the region in quantitative and qualitative terms.

7. Proposition of Environmental Programs

Based on the identification of the main negative environmental impacts that may result from the execution of activities in Terminal **STS08**, this study proposes undertaking the environmental programs listed in the following table.

Environmental Programs and Plans	Negative Environmental Impacts	Phases	
		I	O
- Program of Environmental Management and Environmental Control of Engineering Works	Air pollution; sound, water and soil; generation of solid waste and liquid effluents; changes in and disturbance of the daily life of the population; incompatible workforce for investment implementation and operation	X	X
- Solid Waste Management Subprogram	Generation of solid waste; soil contamination and waterproofing	X	X

Section F - Environmental

- Liquid Effluent Control and Monitoring Subprogram	Effluent generation; soil contamination and waterproofing	X	X
- Air Quality Monitoring Subprogram	Air pollution	X	X
- Noise Control and Monitoring Subprogram	Sound pollution	X	X
- Environmental Education and Social Communication Sub-program	Incompatible practices of workers involved in installation and operation; changes in and disturbance to the daily life of the population	X	X
- Water Quality Monitoring Subprogram	Changing water quality Interference in aquatic biota	X	X
- Sub-program for monitoring vegetation suppression	Change in local flora	X	
Risk Management Program/Emergency Action Plan (PAE) Individual Emergency Plan (PEI) Mutual Aid Plan (MAP)	Soil contamination and waterproofing Risk of accidents with hazardous products	X	X
Pest and Vector Control Program	Proliferation of harmful sinanthropic fauna		X

Table 4: Main environmental programs and negative environmental impacts related to investment implementation (I) and operation (O) phases for **STS08**.

Source: EPL.

7.1. Implementation Phase

7.1.1. Program of Environmental Management and Environmental Control of Works

The Program for Construction Management and Environmental Control - PGCAO aims at avoiding or minimizing potential negative environmental impacts. The program covers a set of recommended basic guidelines and techniques, to be applied before and during the investment implementation.

In general, the main objectives of this program are:

- To Ensure that the development of the planned interventions occurs in accordance with current legislation, avoiding or reducing possible negative environmental impacts. The program achieves this by implementing preventive control and mitigating measures;
 - To Implement appropriate environmental operating practices;
 - To Implement monitoring actions necessary to evaluate the effectiveness of adopted environmental control actions;
 - To perform actions aimed at the health and safety of workers;
 - To monitor and supervise other environmental programs;
 - To ensure full compliance with existing laws, rules regulations from environmental agencies and other authorities;
 - To adequately implement sustainable construction site practices;
 - To provide adequate staff access to workstations; and
 - To adequately demobilized construction sites, if necessary.

With the intent of easing reader's comprehension, this study organized the program's actions under specific sub-programs. Each subprogram and accompanying descriptions are presented below:

Section F - Environmental

- Solid Waste Management Subprogram:

Solid waste management aims to establish a set of activities that allows the correct process of collection, packaging, transportation and final disposal of the terminal's waste.

When appropriate, waste generated shall have a certification document. Such documents are called Waste Manifest and Waste Certificates of Final Disposal. These documents attest that a particular waste was handled correctly by the agent responsible for its disposal.

To complete this subprogram, the interested party should comply with the following guidelines:

- Classification and Segregation of generated waste, according to the applicable standards and resolutions;
- Proper packaging and storage;
- Collection and transportation, according to existing technical standards;
- Obtaining certificates of industrial waste disposal, and issuance of industrial waste transport manifests, where applicable;
- Proper final destination/disposal; and
- Specific procedures for generation, segregation, packaging and final transport of waste from the Terminal.

- Liquid Effluent Management Subprogram

This subprogram presents as its main purpose the adequate disposal of liquid effluents produced by the enterprise.

The main actions covered in this subprogram are:

- Verification of correct cement and concrete handling;
- Prevention against oil and grease leaks;
- Control of materials dragged to drainages and bodies of water;
- Effluent Monitoring:
 - Definition of monitoring points;
 - Definition of collection methodology;
 - Treatment of samples;
 - Effluent analysis methodology; and
 - Quality control.

- Air Quality Monitoring Subprogram

Below are the main actions:

- Wetting of unpaved traffic routes and piling up materials;
- Definition of vehicle speed limits on traffic routes;
- Circulation permit for authorized vehicles inside the terminal area
- Maintenance of diesel powered engines; and
- Black fumes inspections of machines, vehicles and other equipment.

- Noise Monitoring Subprogram

Section F - Environmental

The terminal should plan for evaluating and managing sound pressure levels, given its proximity to inhabited areas. To that end, the terminal will have to systematically record its noise levels in order to continually evaluate its adequacy.

If noise level measurements are above the tolerance limits established by CONAMA Resolution No. 01/90 and ABNT Standard NBR 10.151/2000, the terminal must implement control measures that reduce the emission of noise pollution should, as well as the implementation of monitoring to check the efficiency of adopted measures.

Below are the main actions:

- Implementation of control measures, such as verification of correct equipment maintenance;
 - Time-based restriction regarding construction activity, avoiding night work, so as not to cause discomfort to the surrounding population (when it exists);
 - Monitoring of noise levels:
 - Definition of noise monitoring points;
 - Performance of noise measurements based on NBR 10.151, which is contained in Conama Resolution No. 01/90; and
 - Analysis of the results obtained in all points.
- Social Communication and Environmental Education Sub-Program

Public Relations

This section of the program establishes a framework to decide on the best manner and medium to address the terminal's main external stakeholders, including workers, different segments of the population and/or other institutions. Content wise, the communication should inform interested parties on the terminal's social-environmental programs that mitigate its negative impacts.

Thus, the implementation of a Social Communication Subprogram will provide a rapprochement between the various stakeholders and the new lessee, disseminating information about the progress of investments implementation and operations of the Terminal.

At the same time, this Subprogram allows for the consideration of society's inputs, better aligning its activities to the population expectations and concerns. The systematization of proposals and the possibility adding tools for progress evaluation should permeate the entire communication process.

Among the possible activities, the following stand out:

- Preparation and distribution of information material related to the terminal's investment implementation and its operation;
- Dissemination and guidance on new jobs opening;
- Creation of an Ombudsman's Office, with free telephone line and public e-mail, for community service by technicians able to provide information about the Terminal and its activities. In addition the office should also be able receive and catalogue the community's suggestions, doubts and criticisms about the terminal.
 - Conducting periodic meetings with municipal, state and federal authorities related to port activities and environmental inspection to discuss the progress of environmental programs;
 - Appoint and train spokespersons who are knowledgeable of the terminal's Environmental Programs, being prepared to answer to the press and the wider community.

Environmental education

Section F - Environmental

A successful Environmental Education Subprogram should have the following main objectives:

- Educate and guide the terminal's workers/inspectors on environmental protection measures, as well as on appropriate relationship conduct with the wider community;
- Present a list of adoptable measures that intend to minimize the interference of the enterprise on the environment;
- Improvement and professional training for construction workers, training them on occupational safety procedures, including the mandatory use of PPE. Regarding the environment awareness, workers should become conscious of their impact and how to best minimize it, specially during construction work. Finally, the program should improve quality of the work conditions, the reduction of its costs and compatibility with the legal requirements related to the environment, health and safety of workers.

- Water Quality Monitoring Subprogram

The Water Quality Monitoring Subprogram program periodically monitors the impact from the terminal's activities on the quality of the port channel water, as well as on fresh and groundwater reservoirs.

The program collects water samples at points along the navigation channel used by the terminal and in the area it covers. After sample collections, program personnel should carry out in situ physicochemical measurements followed by chemical analyses in the laboratory.

- Monitoring programme for the suppression of vegetation

The main objectives of this program are:

- To organize and analyze preliminary information about the that are areas subject to removal of the vegetation.
- To determine assumptions and criteria for structuring vegetation suppression operations.
- To delineate relevant guidelines for conducting vegetation suppression controls in areas impacted by construction works.
- To perform the suppression within the designated boundaries while following adequate environmental procedures that effectively control and monitor the activity.
- To Identify if amongst the suppressed area are there any protected species and propose measures for ensuring their preservation, and if it is really necessary to suppress this native vegetation.
- To estimate the volume of woody material to be removed.
- To quantify the vegetation effectively suppressed by phytophysiology, aiming at controlling wood material generated in the process, if any.
- To enable an economic use to firewood and regular wood generated by vegetation suppression actions.
- To enable the directing of land-based fauna migration towards the remaining forest areas, reducing mortality and "stress" caused by manipulation of animals during rescue actions.
- To promote scientific use of botanical material available in the area and the use of germplasm (seeds, seedlings, rhizomes and cuttings), aiding the recovery work of areas degraded by construction developments, including areas that have riparian vegetation.

7.2. Operation Phase

7.2.1. Environmental Management and Control Program

The Environmental Management and Control Program aims to monitor/control environmental quality within the area of the Terminal, allowing the anticipation of corrective or preventive actions, minimizing environmental risks related to its activity.

The program establishes measures for evaluating the port facility's quality of solid waste generation, liquid effluents, atmospheric emissions and noise. The implementation of monitoring measures aims at monitoring the proper functioning of control systems, ensuring compliance with established standards.

This program groups proposed actions for monitoring and controlling possible impacts on the environment due to the terminal's operations. With that in mind, this section of the study is subdivides this program into its proposed actions. For clarity, this study presents these actions in sequence. Finally, it is worth noting these actions should be implemented during the terminal's operating phase.

Concerning environmental management at the terminal level, for program to be effective the terminal will have to employ its own team. This team will be responsible for planning and monitoring programs executed under the Basic Environmental Plan – PBA. In addition, the team will also be taking care of issues inherent to work safety and the PGR/PAE.

- Solid Waste Management Subprogram
 - Classification and segregation of generated waste, according to the applicable standards and resolutions;
 - Proper storage infrastructure and practices;
 - Collection and transportation practices that are adherent to existing technical standards;
 - Obtaining certificates for disposing of industrial waste and issuance of industrial waste transport manifests, where applicable;
 - Properly arranging for the final destination/disposal of waste; and
 - Specific procedures for generation, segregation, packaging and final transport of Terminal waste.
- Liquid Effluent Management Subprogram
 - Definition of monitoring points;
 - Definition of collection methodology;
 - Treatment of samples;
 - Effluent analysis methodology; and
 - Quality control.
- Noise Control and Monitoring Subprogram
 - Definition of noise monitoring points;
 - Performance of noise measurements based on NBR 10.151, which is contained in CONAMA Resolution 01/90; and
 - Analysis of results from all monitoring points.
- Air Quality Monitoring Subprogram
 - Maintenance of diesel powered equipment;

Section F - Environmental

- Inspection black fumes coming out of machines, vehicles and engines;
- Monitoring of baghouse filters; and
- Monitoring of compact filters.
- Water Quality Monitoring Subprogram
 - The Water Quality Monitoring Subprogram program periodically monitors the impact from the terminal's activities on the quality of the port channel water, as well as on fresh and groundwater reservoirs.
 - The program collects water samples at points along the navigation channel used by the terminal and in the area it covers. After sample collections, program personnel should carry out in situ physicochemical measurements followed by chemical analyses in the laboratory.
 - Integration of results from water and sediment quality analysis and other programs, seeking an understanding of the relationships between environments, their properties and the living conditions of these animals.
- Public Relations and Environmental Education Sub-Program

This section of the program establishes a framework to decide on the best manner and medium to address the terminal's main external stakeholders, including workers, different segments of the population and/or other institutions. Content wise, the communication should inform interested parties on the terminal's social-environmental programs that mitigate its negative impacts.

Thus, the implementation of a Social Communication Subprogram will provide a rapprochement between the various stakeholders and the new lessee, disseminating information about the progress of investments implementation and operations of the Terminal.

At the same time, this Subprogram allows for the consideration of society's inputs, better aligning its activities to the population expectations and concerns. The systematization of proposals and the possibility adding tools for progress evaluation should permeate the entire communication process.

Among the main activities, the following stand out:

- Preparing and distributing information relating to how the terminal is planning on meeting its operational demands.
- Sustaining a relationship between the community and the enterprise. It advised that the terminal should reserve a place for receiving visitors and conducting meetings with the community, presentation of institutional programs, relationship with the press, public institutions, academics and opinion makers); and
- Scheduling regular communication activities.

Environmental education actions should have as main objectives:

- Promote environmental awareness of various social actors in the nearby communities, encouraging the adoption of practices that are compatible with preserving the environment.
- Educate and guide the terminal's workers/inspectors on environmental protection measures, as well as on appropriately establish a relationship with the wider community;
- Present a list of adoptable measures that intend to minimize the interference of the enterprise on the environment;

Section F - Environmental

➤ Produce and edit educational material for the region's population, fostering the creation disseminators and opinion makers that support increased awareness of the importance of conserving and/or recovering the environment.

7.2.2. Risk Management Program / Emergency Action Plan - PGR/PAE

The Risk Management Program (PGR) presents procedures to address possible accidental scenarios including implementation of best operational practices, recurring preventive maintenance, and employee training and Emergency Care Plan.

The PGR has as its basic principle the compliance with current legislation and standards, always seeking:

- Minimize the risk of operation;
- Ensure the safety of your employees and the community;
- Develop processes and materials suitable for the preservation of the environment;
- Valuing and preserving the company's assets; and
- Improve the use of available resources, focusing on safety, quality and productivity.

The Program should contain the following activities:

- Security information;
- Risk analysis;
- Modification management;
- Maintenance procedures;
- Operational procedures;
- Training program;
- Incident investigation procedures;
- Internal audits of the production system; and
- Emergency Response Plan (PAE).

The activities in the Risk Management Program (PGR) should be available to all employees with responsibilities related to these activities and the terminal operations as whole.

The Emergency Action Plan (PAE) is an integral part of the Risk Management Program. The purpose of PAE is to provide a set of guidelines, data and information that support logical, responses to emergency situations. The scope of emergencies covered by the program should include any unforeseen event with the potential to cause damage to the surrounding population and the environment.

The PAE procedures are dependent on the enterprise's facilities characteristics and operation.

In addition to defining emergency procedures, the Plan should also:

- Define responsibilities of those involved in responding to emergency situations, with a specific organizational structure;
- Promote the integration of emergency response actions with other institutions, enabling the triggering of integrated and coordinated activities, increasing the likelihood that expected results will be achieved;
- Set aside resources (human and physical) to adequately respond to possible accidents. This reserved resources should be in excess of properly installing triggers/alarms and conducting routines emergency check-ups. The nature of response should be aligned with the nature of likely accidents scenarios in the terminal.

Section F - Environmental

7.2.3. Individual Emergency Plan - PEI

According to Federal Law No. 9,966/2000 and CONAMA Resolution No. 398/2008, depending on the characteristics of the enterprise, during its operation phase, the company is required to have an Emergency Plan - PEI for oil contamination of waters under national jurisdiction.

At the time of its approval by the terminal, the PEI must attest to the ability of the facility to immediately respond to oil contamination incidents, in its various forms. The organization must be able to rely on its own resources (human and physical). The plan does not prohibit the utilization of third party resources, but such agreements must be signed before the incident actually occurs.

7.2.4. Mutual Assistance Plan - MAP

The MAP aims to ensure and foster the following key objectives: effective compliance with relevant standards, continuous technical improvement, the exchange of information and integrated knowledge of potential risks to each stakeholder. Achieving such objectives should enable the organization to respond efficiently and in a coordinated manner.

Regarding the participation of companies in MAP, it is essential that they have their respective Emergency Control Plans - PCE, in accordance with the number of NR29 and Law No. 9966/00.

MAP acts complementary with the State Fire Department and other relevant public or private institutions. In this way, MAP offers, infrastructure, techniques, and services that allow different actors to cooperate better. Particularly, MAP promotes the development of studies that are necessary for technical and operational improvements, mitigating the impact and risk of emergency situations. In essence, MAP actions support an strategic action plan that is rational and efficient, taking into account the availability of material resources applicable to each emergency scenario.

7.2.5. Pest and Vector Control Program

- Actions to control and reduce the population of rodents, pigeons, mosquitoes, cockroaches, bees and other vectors; and
- Environmental management measures and various management actions, aiming at the continuous improvement to the environment and to port facilities.

8. Environmental Audit

Internal audits should be carried out at during the terminal's operation phase to verify the effectiveness of the existing socio-environmental system. If the audit finds any non-conformities, corrective actions should be taken to ensure adherence of the system to ISO 14.001, CONAMA Resolution No. 306 of July 5, 2002 and ISO 45,001 (updates OHSAS 18,001).

9. Management of Contaminated Area - GAC

During its lease, the future lessee is responsible for the management of contaminated areas (GAC). The new lessee expected to undertake the necessary actions to assess the characteristics of the particular site. In addition, the new lessee must provide authorities with the necessary decision-making instruments allowing for the selection of the most appropriate forms of intervention, minimizing the contamination risk to the population and the environment.

Section F - Environmental

In order to run an effective GAG program, the new lessee must follow a list of sequential steps, where the information obtained in each step serves as basis of support to the next step. In essence, the program should follow the following sequence: Preliminary Environmental Assessment (Phase I), Confirmatory Investigation (Phase II), and Detailed Investigation (Phase III).

9.1. Preliminary Environmental Assessment (Phase I)

Phase I aims at carrying out an initial diagnosis of potentially contaminated areas (CA). That is, Phase I entails the preliminary investigation of environmental liabilities. Such investigations include the gathering of information about areas of interest and the validation of this information in subsequent field inspections.

In sum, implementation of this step will enable...

- Collection of information about each CA, supporting the development of GAC's next steps;
- Gathering relevant documentation on the area that validates suspicions of contamination in the area;
- Establish the initial conceptual model of each area under evaluation;
- Check the need for emergency measures in the areas.

9.2. Confirmatory Environmental Investigation (Phase II)

The confirmatory investigation stage comes after the identification phase. The main objective of this phase is to confirm or refute the contamination hypothesis in a particular area. In its first step, phase II, management should evaluate the need for a detailed investigation in the area of interest, based on the gathered information in phase I.

Thus, results obtained in the confirmatory investigation stage are important to support the actions of management or environmental control body, who are in charge of selecting the responsible agent for the contamination and necessary actions to resolve the issue.

In essence, to confirm an area is contaminated, investigators must first analyze soil and/or groundwater samples, sourced from strategically positioned points. Next, investigators interpret results from the sample analyses by comparing its concentration values with established standardized limits, set by the body responsible for managing contaminated areas.

Basically, conducting a Confirmatory Environmental Research study consists of following the steps below:

- Sampling plan;
- Collection of soil and groundwater and surface water samples;
- Conducting chemical and physicochemical analyses;
- Interpretation of the results; and
- Integrated diagnosis.

9.3. Detailed Environmental Research (Phase III)

After confirming that an area is contaminated, it is necessary to define what measures should be taken, in order to immediately contain damage to the surrounding area.

These measures are set according to the contamination's following characteristics: extent of damage, the nature of contaminants, their toxicity/carcinogenicity, as well as the possible effects on persons, the environment and other protected assets. A set of adequate actions are likely to include:

- Adoption of emergency measures: elimination of non-aqueous free phases and restricted access to the area;
- Application of remediation techniques: application of remediation methodologies for soil and groundwater, aiming at reducing the concentrations of the different compounds to acceptable levels (as per limits found the risk assessment phase);
- Establishment of institutional control measures: Together with the competent bodies, evaluate the necessity of region-wide issuing restrictions on use of nearby land or groundwater;
- Establishment of engineering measures: recomposition of the areas after the remediation actions;
- Environmental Management Actions: monitoring of groundwater quality and management of the removal/disposal of contaminated waste, particularly, where soil samples show a higher presence of contaminants of interest (secondary sources).

In the detailed investigation stage, the objective is to quantify the degree of contamination. In other words, the objective is to establish the source of contamination and to quantify the its actual volume damage to the area. Hence, this action includes determining the physical dimensions of contamination (volume and/or extension), the types of contaminants present and their concentrations. Similarly, the investigation must establish the characteristics of contamination plumes. Particularly, the investigation should quantify the plume's limits and propagation rate.

It must be pointed out that, the relevant area for investigation should cover, in addition to the area under the lessee 's control, any remaining area in its surroundings that would likely have been affected, enabling the complete delimitation of contamination sources. For example, such a complete passement allows for the understanding of the following damages: extent of waste deposits, dump infiltration ditches, leak propagation rate and of other similar episodes;

In sum, this investigation process should allow for:

- The complete, three-dimensional, delimitation of groundwater contamination plumes.
- The identification risks to resources users in the surrounding rea.

10. Pricing of Environmental Costs for Terminal Licensing

This study calculates socio-environmental costs related to the terminal's implementation and operation was based on the following assumptions:

- The costs of permanent activities, such as monitoring and environmental controls, are calculated for the entire lease period.

 Section F - Environmental

- All costs related to environmental studies and programs are based on DNIT's price database for hiring consulting work, as of June/2020.
- The costs related to "environmental licensing" include the following items: costs of preparing environmental studies compatible with the scale of the enterprise and all licensing expenses (including installation licenses, operation licenses and their renewals throughout the lease period).
- For further information on required permits and environmental studies, refer the chapter on environmental licensing.

10.1. Licensing Fees

The costs related to environmental licensing include the expenses with undertaking the required analysis. Hence, the final cost to the terminal is a function the complexity factor of its polluting sources. The factor itself will have corresponding definitions and fees set by CETESB. In sum, the rational for calculating fees (Table 5) takes into account the particularities of the terminal's activities and its output represents the total costs of issuing the full set of licenses (LP, LI and LO) .

The licensing fees were calculated based on the values CETESB's methodology, as presented in the following table.

License issuance price
The price formula varies according to the nature of the activity / enterprise.
A - Manufacturing Industries
- Warehousing and wholesale of flammable products.
For LP concomitant with LI, LI and LO
P = 70 + (1.5 x W x Ac) where:
P = price to be charged, expressed in UFESP;
Ac = square root of the sum developed area + outdoor area (m ²); and
W = source complexity factor.
For LP = 0.30 x P
For small organizations (ME and EPP) = 0.15 x P
For LO Renewal = 0.5 x P(LO)
P(LO) = LO price
UFESP 2020 = R\$ 27,61

Table 5: Costs issuance of environmental license Terminal **STS08**.
Sources: <https://licenciamento.cetesb.sp.gov.br/cetesb/detalhes.asp> and
<https://licenciamento.cetesb.sp.gov.br/cetesb/fator.asp>.

Thus, considering that **STS08's** license must cover an area of 152,324m² and its complexity factor (W) is 3.0 (<https://licenciamento.cetesb.sp.gov.br/cetesb/fator.asp>), one can arrive at the corresponding issuance cost for the terminal.

$$P = 70 + (1,5 \times W \times Ac)$$

$$P = 70 + (1,5 \times 3,0 \times \sqrt{152.324})$$

Section F - Environmental

$$P \cong 1.826,29 \text{ UFESP}$$

The value of obtaining LI and LO is calculated by multiplying *P* by the UFESP value in 2020:

$$P = 1.826,29 \times R\$ 27,61$$

$$P = R\$ 50.423,92$$

The analysis value for issuing LP is calculated below:

$$LP = 0,3 \times P$$

$$LP = 0,3 \times 1.826,29$$

$$LP = 547,89 \times R\$ 27,61$$

$$LP = R\$ 15.127,18$$

In relation to the 16.000 m² area for the new Railway Access, considering the complexity factor of the pollution source (*W*) which is 3,0 (<https://licenciamento.cetesb.sp.gov.br/cetesb/fator.asp>), the price to be charged is as follows:

$$P = 70 + (1,5 \times W \times Ac)$$

$$P = 70 + (1,5 \times 3,0 \times \sqrt{16.000})$$

$$P \cong 639,21 \text{ UFESP}$$

The final value of the LI and the LO is calculated by multiplying *P* by the value of the UFESP in 2020:

$$P = 639,21 \times R\$ 27,61$$

$$P = R\$ 17.648,59$$

The value of LP is calculated as follows:

$$LP = 0,3 \times P$$

$$LP = 0,3 \times 639,21$$

$$LP = 191,76 \times R\$ 27,61$$

$$LP = R\$ 5.294,58$$

As already discussed in this Report, the new lessee will have to incur licensing costs for the implementation of new tanks and of the new railway access in its undeveloped area. Namely, the new lessee must obtain a new LP, LI and LO, resulting from distinct environmental permit processes.

As for the segment of STS08's area that is licensed, the study's strategy for after the area is returned to STS08 (2 years after the auction) is that the new lessee should apply for a new OP with CETESB, and the new license should cover the entire Terminal.

Section F - Environmental

The study also assumes that the operating licenses for the terminal, including the railway access, shall be combined into one license and shall be issued with a 5-year validity, requiring recurrent renewal throughout the period the lease period.

$$LO \text{ (renovação)} = 0,5 \times P$$

$$LO \text{ (renovação)} = 0,5 \times 1.916,23 (1.826,29 + 639,21)$$

$$LO \text{ (renovação)} = 958,11 \times R\$ 27,61$$

$$LO \text{ (renovação)} = 26.453,55$$

Finally, the full cost license acquisition must factor in costs related to conducting environmental impact assessment analysis. For estimating analysis cost, the study consulted CETESB's service database (Annex 3 - Decree No. 62,973 of November 28, 2017). Thus, the study can arrive at the full license cost for the terminal by considering the following: analysis for **STS08** Preliminary Environmental Report – RAP; the licensing costs includes issuance and renewal (as calculated above); and suppression of native vegetation (ASV).

The table below summarizes the situation described for this item, excluding the area where the new Railway Access will be implemented. It is important to point out that the value of the renovated LO, specified in the table below, considered the unification of both areas under one license.

STS08	LP	LI	ASV	LO	LO Renewal
Licence	R\$ 15.127,18	R\$ 50.423,92	R\$ 552,20	R\$ 50.423,92	R\$ 26.453,54
Analysis	R\$ 62.122,50	R\$ 62.122,50	R\$ 1.380,50	R\$ 62.122,50	R\$ 62.122,50
Total	R\$ 77.249,68	R\$ 112.546,42	R\$ 1.932,70	R\$ 112.546,42	R\$ 88.576,04

Table 6: environmental licensing Costs for **STS08** except the area of the new Railway Access.

Sources: <https://licenciamento.cetesb.sp.gov.br/cetesb/detalhes.asp> and <https://licenciamento.cetesb.sp.gov.br/cetesb/fator.asp>

The table below summarizes the situation described for the area of the new Railway Access.

STS08-Acesso Ferroviário	LP	LI	ASV	LO
License	R\$ 5.294,58	R\$ 17.648,59	R\$ 552,20	R\$ 17.648,59
Analysis	R\$ 62.122,50	R\$ 62.122,50	R\$ 8.283,00	R\$ 62.122,50
Total	R\$ 67.417,08	R\$ 79.771,09	R\$ 8.835,20	R\$ 79.771,09

Table 7: Environmental Permit Costs for Terminal **STS08**

Sources: <https://licenciamento.cetesb.sp.gov.br/cetesb/detalhes.asp> e <https://licenciamento.cetesb.sp.gov.br/cetesb/fator.asp>

Section F - Environmental

10.2. Environmental Studies

In view of the characteristics STS08's area and its activity, this section believes that the most indicated study to support CTESB's analysis for a requirement of the LP will be a Preliminary Environmental Report – RAP. Considering that the strategy will be to obtain separate environmental permits – one for the tank area and one for the railway access area – two Preliminary Environmental Reports must be prepared. As for LI's application, this section assumes the necessity for Basic Environmental Plan – PBA and a Preliminary Neighborhood Impact Study – EIV, considering the two areas. The need for a PBA arises from the need to mitigate the impacts arising from the implementation of new structures and the operation of the Terminals. As for the new EIV, such study will likely be a requirement to meet current municipal regulations. Finally, it is important that these studies cover both licensed and unlicensed areas.

Thus, considering the scope and complexity of managing STS08's environmental requirements, this section estimates the size of the professional team needed to adequately run the company's environmental department.

It is emphasized that this study estimated salary rates (and accompanying payroll taxes) for these types of professionals according to DNIT's consulting database. The study assumes that the final cost of hiring such services will be a function of the amount of hours spent in each of the project's activities and an accompanying profit margin for the consulting company, as shown in the table below:

Environmental Studies			EIV		EIA/RIMA		PBA		Rap – Rain access	
	R\$/h		hours	Cost (R\$)	hours	Cost (R\$)	hours	Cost (R\$)	hours	Cost (R\$)
General coordination	33.748,50	191,75	100	19.175,28	160	30.680,46	140	26.845,40	160	30.680,46
Characterization of the enterprise	20.803,99	118,20	50	5.910,23	160	18.912,72	120	14.184,54	20	2.364,09
Biotic Medium	20.803,99	118,20	50	5.910,23	160	18.912,72	120	14.184,54	160	18.912,72
Physical Medium	20.803,99	118,20	100	11.820,45	160	18.912,72	120	14.184,54	20	2.364,09
Socioeconomic	20.803,99	118,20	100	11.820,45	60	7.092,27	60	7.092,27	20	2.364,09
Diagrammer / Reviewer / Writer	20.803,99	118,20	10	1.182,05	10	1.182,05	10	1.182,05	10	1.182,05
Subtotal labor				55.818,68		95.692,93		77.673,33		57.867,49
	Unot	R\$/unid	As	Cost (R\$)	As	Cost (R\$)	As	As		Cost (R\$)
Offsets + daily	budget		1,00	5.581,87	1	9.569,29	1	7.767,33	1	5.786,75
Administrative + operational expenses	budget		1,00	16.745,60	1	28.707,88	1	23.302,00	1	17.360,25
Subtotal materials and services										
				22.327,47		38.277,17		31.069,33		23.147,00
SUBTOTAL				78.146,15		133.970,10		108.742,67		81.014,49
Profit	12,00%			9.377,54		16.076,41		13.049,12		9.721,74
taxes	16,62%			14.546,44		24.937,73		20.241,79		15.080,36
OVERALL TOTAL				102.070,13		174.984,25		142.033,58		105.816,59
TOTAL EIV+ EIA/RIMA + PBA+RAP								R\$ 524.904,54		

Table 8: Estimated study preparation costs.

Source: EPL, from DNIT Consulting database.

10.3. Vegetation Compensation

Since the STS08’s expansion plan involves the suppression of native vegetation, it necessary to obtain authorization for eliminating such vegetation. It is also expected that STS08’s new lessee will have to pay for damages to the environment.

In quantifying STS08’s future environmental obligation, this study finds resolution SMA No.7 of January 18, 2017, to be of particular interest to the terminal. The resolution states that, the first step in assessing the cost of vegetation compensation identifying the area’s Priority Class as defined by the Map of Priority Areas for Restoration of Native Vegetation (Annex I). Furthermore, the cost must also consider the stage of regeneration of that the suppressed (Art. 4) vegetation is.

In this way, this section has identified that entire Port of Santos, including STS08, falls into the Low Priority Class of said Map. In addition, recent on-site studies show that the suppressible vegetation is of secondary nature, and it is in the middle stage of regeneration. These facts warrant a compensation multiple equal to 1.5 (one point five) times the suppressed area (paragraph 2, art. 4).

Considering that the strategy will be to obtain separate environmental permits – one for the tank area and one for the railway access area – two Preliminary Environmental Reports/PER must be prepared. The two PERs will include issues related to forest compensation. For the tank area, in view of a vegetation removal area of approximately 9,710 m², given SMA Resolution No. 7/2017, the application of the compensation multiple yields an obligation to revegetate an area of 14,565 m². Thus, from these 14,565 m², this section estimates a total cost of R\$ 83,617,33. The study bases its estimation on TPU/DER/SP’s cost proposition, from June 2019. This 2019 value was corrected for inflation using the accumulated IPC-A up to July 2020. The summary of results is seen on the table below (New plants upkeep considers a period of 36 months).

activity	Unit Value	Quantity	Total
30.01.40.03 Planting Native Forests h>=1.50M (ha)	R\$ 29.914,94	1,46	R\$ 44.343,44
Planting Upkeep with Native Forest (ha/month)	R\$ 735,97	52,38	R\$ 39.273,89
TOTAL COST			R\$ 83.617,33

Table 9: Cost compensating native forest suppression.

Source: Cost base - TPU/DER/SP: June/2020, IPC-A (June/19-June/2020) = 1.018775.

In relation to the Railway Access area, and in view of the estimated removal of vegetation in an area of approximately 16.000 m², when applying the definitions contained in SMA Resolution nº 7/2017, the estimate is that it will be necessary to pay compensation for an area equivalent to 24.000 m². The compensation cost was calculated on the basis of the proposition of TPU/DER/SP, of June 2020, adjusted by the IPC-A of July 2020. The final amount totaled R\$ 137.925,49, as shown below. Planting during a 36-month period was taken into consideration.

Section F - Environmental

activity	Unit Value	Quantity	Total
30.01.40.03 Planting Native Forests h>=1.50M (ha)	R\$ 29.914,94	2,40	R\$ 73.143,82
Planting Upkeep with Native Forest for 36 months (ha/month)	R\$ 735,97	86,40	R\$ 64.781,67
TOTAL COST			R\$ 137.925,49

Table 10: Cost estimate and study for the definition of environmental control measures
Source: Cost base - TPU/DER/SP: June/2020, IPC-A (June/19-June/2020) = 1,018775

10.4. Mitigating and Compensatory Measures Foreseen in the EIV

As already discussed, this study expects that a new EIV will have to be presented to the City of Santos. Hence, the new study is likely to require the new lessee to establish specific mitigating/compensatory measures in the terminal. However, given lack of information regarding the City's methodology in selecting required actions, this study could not price these measures. However, it is likely that the new lessee will incur some sort of cost associated with EIV's obligations.

Therefore, given the uncertainty regarding this cost, the federal government will be the one to bear these costs if they are incurred by the new lessee during environmental licensing process.

10.5. ETE Maintenance Cost

As the use of this ETE will be shared between **STS08** and 08A, it only fair that the expenses required to maintaining this effluent treatment plant are also shared by both entities. In that in mid, the study estimated the plant's total annual upkeep to be R\$ 134,880.00 for each terminal, as shown below.

It is worth noting that this estimate is based on SPA's Electronic Auction No. 5/2019, <http://intranet.portodesantos.com.br/leil Acesso/licitacoes.asp>. In this auction, the price is quoted on a per cubic meter of treated sewage basis, as shown in the table below:

Item	discrimination	Unit	Volume	Unit Cost	Monthly Total (R\$)	Annual Total (R\$)
1	Collection, Treatment and Disposal of Domestic Sewage	m ³	1.000	R\$ 11,24	R\$ 11.240,00	R\$ 134.880,00
TOTAL COST					R\$ 11.240,00	R\$ 134.880,00

Table 11: Estimated costs of maintaining the ETE in **STS08A**.
Source: Electronic Trading No. 5/2019 - SPA.

10.6. Environmental Programs

The new lessee will have to implement environmental programs in order to be granted licenses to implement and operate its terminal. The implementation of such programs is intended to mitigate negative environmental impacts of a particular economic activity. For this study, its authors observed the particularities of implementing such programs for Port Terminals. Hence, the study considered the design of previous EVTEAs under the Port Lease Program – PAP.

Section F - Environmental

Thus, the implementation of these programs was defined as follows:

- During Terminal's investment implementation phase, regarding the Program for Construction Control and Environmental Management – PCGAO (and its respective Subprograms), the study assumes that the new lessee will outsource the services related to the program's implementation.
- As for the Environmental Management Program – PGA, the study assumes that the new lessee will have its own environmental/work safety team to implement the program's actions. This team will also develop actions aimed at Solid Waste Management, Social Communication/Environmental Education. It is worth remembering that the latter program will manage the terminal's relationship with the community and raise employee awareness of sustainability issues. In addition, the team will be responsible for participating in the port's Mutual Assistance Plan (MAP). The sizing of the team will depend on the size of the terminal.
- It is worth emphasizing that the costs of personnel allocated to management of environmental programs and execution of Solid Waste Management Programs, Social Communication and Environmental Education are included in Section D – Operational. Therefore, to avoid double counting, this sections does not consider payroll expenses related to the internal environment/work-safety team.
- All other environmental programs and actions in the operation phase will be outsourced. In this way, the terminal's internal environmental team will also be responsible for managing work done by consultancies. In this case, once again, the study relied on DNIT's database for hiring outside consultants.

The following are cost estimates for the Area **STS08** for each phase of the enterprise.

Mitigating Measures and Environmental Programs		
Previous Study	Costs/Year (R\$)	Note
Prior Environmental Assessment Study	45.383,43	1st year
Installation Phase	Costs/Year(R\$)	Note
Program of Environmental Management and Environmental Control of Works	317.683,99	1st to 3rd year
Solid Waste Management Subprogram	45.383,43	1st to 3rd year
Liquid Effluent Control and Monitoring Subprogram	45.383,43	1st to 3rd year
Air Quality Monitoring Subprogram	45.383,43	1st to 3rd year
Noise Control and Monitoring Subprogram	45.383,43	1st to 3rd year
Environmental Education and Social Communication Sub-Program	45.383,43	1st to 3rd year
Water Quality Monitoring Subprogram	45.383,43	1st to 3rd year
Monitoring vegetation suppression	45.383,43	1st to 3rd year
Installation Phase	Costs/Year(R\$)	Note.
Program of Environmental Management and Environmental Control	226.917,14	4th and 5th grade
Solid Waste Management Subprogram	Internal team	4th and 5th grade
Liquid Effluent Control and Monitoring Subprogram	45.383,43	4th and 5th grade
Air Quality Monitoring Subprogram	45.383,43	4th and 5th grade
Noise Control and Monitoring Subprogram	45.383,43	4th and 5th grade
Environmental Education and Social Communication Sub-Program	Own team	4th and 5th grade
Water Quality Monitoring Subprogram	45.383,43	4th and 5th grade

Section F - Environmental

Mitigating Measures and Environmental Programs		
Monitoring vegetation suppression	45.383,43	4th and 5th grade
Operation Phase	Cost/Year	periodicity
Environmental Management	Internal team	-
SGA deployment - year 1	R\$ 144,636.90	1st year
SGA deployment - year 2	R\$ 72,318.45	2nd year
Environmental Management and Control Program	R\$ 181,533.71	biannual
Solid Waste Management Subprogram	Internal team	biannual
Environmental Education and Social Communication Sub-Program	Internal team	biannual
Liquid Effluent Management Subprogram	R\$ 45,383.43	biannual
Noise Control and Monitoring Subprogram	R\$ 45,383.43	biannual
Air Quality Monitoring Subprogram	R\$ 45,383.43	biannual
Water Quality Monitoring Subprogram	R\$ 45,383.43	biannual
Pest and Vector Control Program	R\$ 27,947.08	monthly
Risk Management Program / Emergency Action Plan (PGR/PAE)	R\$ 65,216.77	16,83 ha
elaboration	R\$ 43,477.85	3 years old
Training	R\$ 21,738.92	annual
Individual Emergency Plan (PEI)	R\$ 43,477.85	5 years old
Social Communication Program / Environmental Education Program	Internal team	biannual
CONAMA Audit 306/02	R\$ 34,013.80	2 years old
ISO 14001 Audit	R\$ 34,013.80	3 years old
OHSSAS Audit 18,001	R\$ 34,013.80	3 years old

Table 12: Costs with environmental programs in the implementation and operation phases for **Area STS08**.
Source: EPL, from DNIT Consulting Table, base date june/2020.

This study sourced some of the environmental cost parameters from other Port Lease Program EVTEAs. In selecting these parameters, this study was careful to consider only those programs that had similar technical, methodological, and operational nature as this one. Whenever the study used these parameters, their values were monetarily rebased to June 2020 using the IPC-A index.

Annex **F-1** shows surmises the impact of environmental costs in the project's cash flow, subdividing costs into environmental licensing, environmental programs, as well as environmental management.

Section F - Environmental

Annex F-1 - Environmental Costs

Description	1	2	3	4	5	6	7	8	9	10	11	12	13
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Implementation - Instalation License and studies ☒ Tank Areas (LP+LI+ASV+Studies)	R\$ 716.633,33												
Implementation - Instalation License and studies ☒ Tank Areas -Railway Access Area (LP+LI+ASV)	R\$ 156.023,36												
Operation- Operating License and studies				R\$ 88.576,04	R\$ 112.546,42					R\$ 88.576,04			
Prior Environmental Assessment Study	R\$ 45.383,43												
SGA deployment- year 1				R\$ 144.636,90									
SGA deployment - year 2					R\$ 72.318,45								
Implementation - Program of Environmental Management and Environmental Control of Engineering Works		R\$ 317.683,99	R\$ 226.917,14	R\$ 226.917,14	R\$ 226.917,14								
Environmental compensation		R\$ 83.703,53											
Operation - Program of Environmental Management and Environmental Control				R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71
Sewage Treatment Plant - ETE			R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00
Pest and Vector Control Program	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22
Individual Emergency Plan (PEI)				R\$ 43.477,85						R\$ 43.477,85			
Risk Management Program/Emergency Action Plan (PGR/PAE)				R\$ 21.738,92	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92
CONAMA Audit 306/02						R\$ 34.013,80		R\$ 34.013,80		R\$ 34.013,80		R\$ 34.013,80	
ISO 14001 Audit						R\$ 34.013,80			R\$ 34.013,80			R\$ 34.013,80	
OHSSAS Audit 18,001						R\$ 34.013,80			R\$ 34.013,80			R\$ 34.013,80	
TOTAL	R\$ 948.918,34	R\$ 432.265,74	R\$ 392.675,35	R\$ 872.638,78	R\$ 780.812,86	R\$ 514.550,09	R\$ 369.030,85	R\$ 403.044,65	R\$ 524.014,14	R\$ 491.620,69	R\$ 369.030,85	R\$ 514.550,09	R\$ 369.030,85

Description	14	15	16	17	18	19	20	21	22	23	24	25
	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Implementation - Instalation License and studies ☒ Tank Areas (LP+LI+ASV+Studies)												
Implementation - Instalation License and studies ☒ Tank Areas -Railway Access Area (LP+LI+ASV)												
Operation- Operating License and studies		R\$ 88.576,04					R\$ 88.576,04					R\$ 88.576,04
Prior Environmental Assessment Study												
SGA deployment- year 1												
SGA deployment - year 2												
Implementation - Program of Environmental Management and Environmental Control of Engineering Works												
Environmental compensation												
Operation - Program of Environmental Management and Environmental Control	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71	R\$ 181.533,71
Sewage Treatment Plant - ETE	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00	R\$ 134.880,00
Pest and Vector Control Program	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22	R\$ 30.878,22
Individual Emergency Plan (PEI)	R\$ 43.477,85						R\$ 43.477,85					R\$ 43.477,85
Risk Management Program/Emergency Action Plan (PGR/PAE)	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92	R\$ 21.738,92	R\$ 65.216,77	R\$ 21.738,92
CONAMA Audit 306/02	R\$ 34.013,80		R\$ 34.013,80		R\$ 34.013,80		R\$ 34.013,80		R\$ 34.013,80		R\$ 34.013,80	
ISO 14001 Audit		R\$ 34.013,80			R\$ 34.013,80			R\$ 34.013,80			R\$ 34.013,80	
OHSSAS Audit 18,001		R\$ 34.013,80			R\$ 34.013,80			R\$ 34.013,80			R\$ 34.013,80	
TOTAL	R\$ 446.522,50	R\$ 569.112,33	R\$ 403.044,65	R\$ 369.030,85	R\$ 514.550,09	R\$ 412.508,70	R\$ 491.620,69	R\$ 480.536,30	R\$ 403.044,65	R\$ 369.030,85	R\$ 558.027,94	R\$ 457.606,89