



Environmental and Social Impact Assessment for the Construction and Operation of the Office of Tax Administration Building

ESIA Final Report

Prepared for the Inter-American Development Bank

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April 24, 2017

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Table of Contents

1	Introduction.....	16
1.1	Background of the project.....	16
1.2	Project Objectives	17
1.3	Purpose of an ESIA.....	17
1.4	Purpose of this Document	18
1.5	Approach to the ESIA	19
1.6	Assumptions and limitations	19
1.7	Structure of the Final ESIA Report.....	20
2	Legal and Institutional Framework	22
2.1	Introduction.....	22
2.2	Legal Framework	22
2.3	International Best Practice Standards	26
2.4	Relevant International Conventions	29
2.5	Institutional Framework.....	31
3	The ESIA and Public Consultation Process.....	34
3.1	General Approach to the ESIA	34
3.2	Overview of the followed ESIA Process	35
3.2.1	Specialist studies	36
3.2.2	Impact Assessment Methodology	37
3.2.3	Mitigation.....	41
3.3	Stakeholders' Consultation.....	42
4	Site and Project Description.....	49
4.1	Site Description.....	49
4.2	Analysis of Project Alternatives	51
4.3	Description of the Proposed OTA Building Project	54
4.4	Water Supply	54
4.5	Energy Supply.....	54
4.6	Stormwater Management	55
4.7	Waste Management.....	55
4.8	Project Phasing.....	56
4.9	Construction Phase Activities	57
5	The Affected Environment and Baseline	59
5.1	Biophysical environment	59
5.1.1	Climate and air quality	59

5.1.2	Geology, geomorphology and topography.....	62
5.1.3	Soil	64
5.1.4	Noise	64
5.1.5	Water resources.....	65
5.1.6	Terrestrial ecology	69
5.1.7	Aquatic ecology	70
5.2	Social Baseline and Impact Assessment	71
5.2.1	History and Archaeology	71
5.2.2	Administrative Structure.....	72
5.2.3	Population and Demographics	74
5.2.4	Employment and Occupation.....	76
5.2.5	Education	78
5.2.6	Health and Wellbeing.....	82
5.2.7	Infrastructure and Transportation.....	84
5.2.8	Quality of Life.....	89
5.2.9	Perception about the project.....	90
5.2.10	Other activities in the Area	91
6	Impact Assessment and Overview of Management Plans	93
6.1	Potential Biophysical Impacts.....	93
6.1.1	Soils, Landscape and Land Use	94
6.1.2	Potential contamination of soil resources	94
6.1.3	Landscape changes (visual impacts)	95
6.1.4	Impact on Land Use	96
6.1.5	Air Quality	97
6.1.6	Impacts on Climate Change	100
6.1.7	Noise and ground vibration impacts	100
6.1.8	Water Resources	102
6.1.9	Impacts from solid waste	107
6.1.10	Potential impact of flooding.....	108
6.2	Social Impact Assessment and Management Measures.....	110
6.2.1	Demolition and Resettlement.....	110
6.2.2	Labor and Working Conditions.....	111
6.2.3	Gender Equality	112
6.2.4	Occupational Health and Safety.....	113
6.2.5	Nuisance.....	114
6.2.6	Community Health and Safety	115

6.2.7	Disruption of activities in the area	116
6.2.8	Security and Crime.....	117
6.2.9	Disease prevention	117
6.2.10	Traffic and traffic related accidents	118
6.2.11	Health effects from air emissions.....	119
6.2.12	Parking	120
6.2.13	Reachability of Tax Office.....	121
6.2.14	Economic Effect.....	121
6.2.15	Gender Equality	122
7	Conclusions and Recommendations	123

Appendices

Appendix 1 - Overview of the relevant provisions of the Surinamese laws and regulation	127
Appendix 2 - Primary and Secondary Stakeholders.....	139
Appendix 3 - Information Sheet to Stakeholders	140
Appendix 4 - : Survey instrument for residential areas	142
Appendix 5 - List of Consulted Stakeholders	147
Appendix 6 – List of stakeholders present at Stakeholders meeting.....	149
Appendix 7 – Minutes of stakeholders meeting.....	150
Appendix 8 – Extension plan of the Port Management Company	156

List of Tables

Table 1 - Overview of Conventions relevant to the Project.....	29
Table 2 - Overview of various permits required for current project.....	33
Table 3 - Proposed ESIA specialist studies and relevant specialists.....	36
Table 4 - Overview of IFC standards.....	37
Table 5 - Defining the intensity / magnitude / size of the negative impacts.....	39
Table 6 - Defining the intensity / magnitude / size of the positive impacts.....	40
Table 7 - Defining duration and scale of the impact.....	40
Table 8 - Determination of the Severity Rating of the impact.....	41
Table 9 - Defining the probability of the impact.....	41
Table 10 - Determination of the overall Significance of the impact.....	41
Table 11 - Inquiries for primary stakeholders during consultation.....	43
Table 12 – Monthly average rainfall between 2009 and 2013.....	59
Table 13 - Monthly average rainfall between 2009 and 2013.....	60
Table 14 – Relative humidity and Velocity at the Measuring stations Zanderij (J.A.P. Airport), Nickerie Airport (M.H.F. Airstrip) and Cultuurtuin, 2009 - 2013.....	60
Table 15 – IFC noise levels guidelines.....	65
Table 16 - River catchments of the study area.....	65
Table 17 - Economic Active Population Ressort Beekhuizen and Paramaribo. Source: ABS statistics 2004.....	77
Table 18 - Educational level of population in Ressorts of Paramaribo (2010).....	81
Table 19 - Bus routes passing the Study Site. Source: Nationaal Vervoersbedrijf.....	85
Table 20 - Significance of potential contamination of soil resources from small leaks and spills.....	95
Table 21 - Significance of impact on landscape (visual quality).....	96
Table 22 - Significance of impact on land use.....	96
Table 23 - Significance of reduction in air quality and impaired human health due to construction phase emissions.....	99
Table 24 - Significance of impacts on climate change.....	100
Table 25 - Significance of impact of noise on surrounding communities during the construction phase.....	101
Table 26 - Significance of impact of ground vibrations due to pile driving on surrounding infrastructure during the construction phase.....	102
Table 27 - Significance of impact of increased turbidity and sedimentation in the Suriname River during the construction phase.....	103
Table 28 - Significance of potential contamination of the Suriname River through stormwater discharge during the construction phase.....	104
Table 29 - Significance of potential contamination of the Suriname River.....	106
Table 30 - Significance of potential contamination of groundwater resources.....	107
Table 31 - Significance of impacts from solid waste.....	108
Table 32 - Significance of impacts from flooding.....	109
Table 33 - Significance of impact of construction on resettlement.....	111
Table 34 - Significance of impact of construction on labor rights violation.....	112
Table 35 - Significance of impact of construction on gender equality.....	113
Table 36 - Significance of impact for occupational hazards.....	114
Table 37 - Significance of impact for nuisance (noise, vibration, dust).....	115
Table 38 - Significance of construction on traffic and traffic-related accidents.....	116

Table 39 - Significance of impact of construction on activities in the area	116
Table 40 - Significance of impact on security and crime.....	117
Table 41 - Significance of impact of construction on disease prevention	118
Table 42 - Significance of traffic and traffic-related accidents during operation	119
Table 43 - Significance of impact on incidence of respiratory disease.....	120
Table 44 - Significance of impact on parking.....	120
Table 45 - Significance of impact of reachability tax office.....	121
Table 46 - Significance of impact of economic effects.....	121

List of Figures

Figure 1 - Google Earth image showing the project site.....	50
Figure 2 - Ressorst Beekhuizen with residential areas ‘Beekhuizen’ and ‘Abra Broki’	51
Figure 3 - Land Use Map of Study site.....	51
Figure 4 – Period, day and night-time windrose for 2006 and 2007 at the Zanderij International Airport.	61
Figure 5 - Geological cross section through northern Suriname.....	62
Figure 6 – Geology of the lower Suriname River	63
Figure 7 - Hydrogeological section Zanderij-Paramaribo	69
Figure 8 - Plantation Map of Suriname with plantation ‘Beekhuysen’. Source: ARCGIS Plantation Map of Suriname	71
Figure 9 – Overview of districts and ressorts	73
Figure 10 - Population of Ressorst Beekhuizen and Paramaribo. Source: ABS 2014	74
Figure 11 - Population by occupational group. Source: ABS Statistics 2004.....	78
Figure 12 - Literacy rate in Suriname. Source: UNESCO Institute for Statistics	80
Figure 13 - Completed educational levels within the ressort of Paramaribo. Source: ABS Statistics 2004	80
Figure 14 - Schools in ressort Beekhuizen.....	81
Figure 15 - Healthcare facilities in the area	83
Figure 16 - Traffic situation at the study site	88
Figure 17 - Traffic fatalities in Suriname 2009-2016. Source: ABS, 2016. Mohan, 2013	89

Abbreviations

ADI	Area of Direct Influence
AII	Area of Indirect Influence
amsl	Above mean sea level
BOG	Bureau voor Opendare Gezondheidszorg (Bureau for Public Health)
dB	Decibel
EA	Environmental Assessment
EBS	Energie Bedrijven Suriname (Electrical Company Suriname)
EHS	Environment, Health, and Safety
EPAR	Electricity Paramaribo
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FISEG	Fiscal Strengthening for Economic Growth
IADB or IDB	Inter-American Development Bank
IFC	International Finance Corporation
ISPS	International Ship and Port Facility
NIMOS	Nationaal Instituut voor Milieu en Ontwikkeling in Suriname (National Institute for Environment and Development in Suriname)
NMR	Nationaal Milieu Raad (National Council for the Environment)
OTA	Office of Tax Administration
SWM	Surinaamsche Waterleiding Maatschappij (Water Supply Company)
TSS	Total Suspended Solids

Executive Summary

Introduction

Since 2011, the government has been strengthening its fiscal stance. As part of this ongoing effort, the Inter-American Development Bank (IADB) has been supporting the authorities through the Fiscal Strengthening for Economic Growth (FISEG) Program. The specific objectives of the Program are: to increase indirect tax revenue and to improve the quality of expenditures by strengthening the budgetary process through the strengthening of the Office of Tax Administration (OTA) including Customs; establishing a Procurement Department and building a modern Treasury Department to combine the treasury functions currently being carried out by different institutions. Therefore, two new building sections of the OTA and the Customs will be built in Paramaribo. Therefore, in seeking to move forward with this project, the Ministry of Finance with funds of IADB, contracted the services of 3 consultants to conduct an Environmental and Social Assessment (ESIA) and Environmental and Social Management Plan (ESMP).

Project Description

The current office facilities of Tax Administration as well as that of the Customs do not meet the requirements to provide efficient services. Moreover, the Ministry of Finance must pay high rent for most of those offices. The government-owned offices such as the Head office of Tax Administration at Combé is due for renovation. The costs for a thorough renovation will be very high. Therefore, the Ministry of Finance decides to construct an office complex for the Office of Tax Administration and the Customs

The overall objectives of the proposed OTA and Customs Building Project are to: 1) centralized most of the services of the Tax Administration for an effective execution of their tasks and to provide efficient services to the public, and 2) accommodate the customs in their own facility that meets the contemporary requirements to improve their services.

Methodology

The ESIA was conducted using different recognized standards, methods and approaches, and international best practices, inclusive of the IADB's guidelines for conducting Environmental

Impact Assessment of Investment Projects and the IFC Performance Standards. These methods and approaches are detailed within the relevant section of the report.

Meetings were held with the Ministry of Finance and architects to gather background information on the project. Field visits were carried out to determine and evaluate impacts of the project based on direct observations and professional judgment. A comprehensive content review of pertinent literature and some desktop techniques were used to complement or supplement field data where it was not available. In addition, Individual stakeholder's consultations were carried out to capture public views and concerns about the proposed project. A stakeholders meeting was organized to present the findings of the ESIA and to obtain additional comments.

Legal and Institutional Framework

Suriname's environmental regulatory regime is not yet fully developed and currently, there lacks legislation dealing specifically with environmental management. The sectoral legislation relevant to environmental management has been identified for this project, as well as all relevant occupational health, safety and security regulations. Beside the national legal regime, there are a number of international Conventions ratified by Suriname, which have to be considered. However, due to Suriname's law system, these conventions are only enforceable when transformed into national legislation.

Where national legislation, standards and guidelines are lacking, international standards like the IFC World Bank standards are applied in this study.

For the current project, the IFC Environmental, Health and Safety Guidelines developed for Construction and Decommissioning as well as the IADB Guidelines for conducting Environmental Impact Assessment of Investment Projects have been used as guidance documents.

To meet national requirements, the following need to be considered in both the construction as well as in the operational phase of the project:

Compliance with the environmental stipulations in the Nuisance Act, Building Act, Police Criminal Act and the Penal Act. The Ministries of Regional Development (Districts Commissioner of Wanica), Public Works, Transport and Communication and Justice and Police are responsible for the enforcement of the respective laws and regulations

The project should comply with the identified occupational health and safety regulations. The

Labour Inspection Division of the Ministry of Labour is responsible for enforcement. The road safety regulations fall under the responsibility of the Ministry of Justice and Police.

The final report will be send to NIMOS. The Ministry of Finance who acts as the project proponent will ensure the project is in compliance with the required laws and regulations and international standards as identified in the current study.

Biophysical environment

In the area around the project site, daytime winds usually blow from the east and night-time winds from the north-east. Conditions are calmer at night than during the day.

The soil at the project site had been disturbed for many decades as the area is used for different purposes. Nowadays, there are several small office buildings on the site that are being used by the Port Management Company. Therefore, it is expected that the land has been filled to make it suitable for those buildings. Sand of the nearby ridges is normally used for this purpose.

Noise levels in the area are likely to comprise an amalgam of noise levels typical of industrial and commercial areas. Main noise sources in the vicinity of the project site are likely to be the Port where 24-hours operations are conducted during 7 days in a week, and the traffic, especially during day times. However, it is not expected that the noise levels will exceed the IFC guideline levels for industrial area.

Water quality studies done for the Suriname River at points near the project site indicates that the river is likely to be contaminated with coliforms and heavy metals. The direct discharges of untreated wastewater through the canals may be the major contributors to the contamination of the Suriname River near the project site.

The vegetation consists mainly of low grass, and the terrestrial animals that may occur along the lower Suriname River are those that commonly live close to humans, such as bats, rodents, snakes, lizards and birds. No fish species of concern are known to occur in this part of the Suriname River.

Environmental Impact Assessment

During construction, potential sources of air quality and climate change impacts include wind-blown sand exposed during earthworks and exhaust fumes of construction/drilling equipment. The

magnitude of potential air quality impacts is considered to have medium effect on the environment. It is also expected that the traffic at the main roads in the vicinity of the project area will increase due to transport of construction material and workers. Consequently, the duration of traffic jams might also be longer, causing more emissions of exhaust fumes, noise and vibrations. The potential impact of reduced air quality on surrounding communities and climate change impacts during the construction phase therefore is assessed to be of moderate effect. However, by maintaining all fuel driven equipment in good condition, managing the traffic around the project site, and creating possible alternative routes, those impacts can be reduced to minor effects.

The potential impacts from noise and vibrations due to pile driving activities are of major concern as it may have moderate effects to the surrounding infrastructures. A detailed study on the geotechnical features of the project site is recommended in order to determine the proper pile driving techniques for that area to reduce as much as possible the impacts.

Other potential impacts on shallow groundwater, surface water, and land were also assessed. The impacts of these aspects vary from negligible to minor impacts. Even though it is not required, mitigation measures have been proposed for all the above mentioned potential impacts.

The impacts from solid waste generated on site during the construction and operations phase are considered to be of minor effects. With the implementation of the proposed mitigation measures, those impacts will be reduced to negligible effects. Good housekeeping, an adequate purchasing policy, and awareness programs with regard to recycling, re-use and reduction of waste generation are some recommendations to manage the solid waste generation and handling.

Socio-Economic Environment

The area in direct vicinity to the proposed project site is characterized by commercial and industrial activities such as gas stations, bank, police station, and office buildings. Adjacent to the site is a port located which annually handles 90% of the imported goods on which Suriname's economy is dependent. The harbor houses the customs department as well as several port services, such as shipping, freight and transport companies. Only few medical facilities open to the public – pharmacy and clinic - are found near the proposed site.

Two creole-dominated residential areas, Abra Broki and Beekhuizen, are in indirect vicinity to the project site. Both these crowded neighborhoods have approximately 40% single parent households. As one of the poorer areas of Paramaribo, Abra Broki and Beekhuizen are

characterized with relatively high unemployment rates and, generally, residents have low educational levels and therefore work in the informal sector. During some hours of the day, young men are loitering on street corners. Incidents of crime have been occurring in both neighborhoods, and this has affected the resident's safety feeling.

All traffic from the industrial and residential areas needs to pass through the main road: Van 't Hogerhuysstraat. This street is one of the busiest streets in Paramaribo, with an estimated 40,000 cars and 32 bus routes passing daily. Some companies and individuals use the main street as a hub for picking up passengers for longer trips to interior/south. Of the six junctions and one roundabout that exist on the main road, only one junction is traffic light-regulated. This leads to heavy traffic congestion during peak hours which causes irritation with the surrounding residents and businesses. The main road records the highest combined number - 12,7% - of all traffic accidents in Paramaribo.

Social Impact assessment

The proposed OTA building will provide a positive impact for residents living in South-West Paramaribo because the tax office comes in closer reach.

During operation of the OTA buildings, the potential impact on traffic and traffic safety for surrounding businesses and residents comes from the extra 800+ peoples that must travel to work and park at the industrial complex. This will become a moderate impact after taking adequate management measures.

Other potential impacts are caused by i) nuisance from excessive noise and flying dust from trucks and other moving vehicles and vibration from the pile driving for the construction of the building, ii) resettlement of the inhabitants of buildings that are currently located at the site, iii) occupational hazard, iv) violation of working hours and conditions, v) increase in communicable diseases. With adequate measures, all these potential impacts can be made negligible.

During operation of the OTA buildings, the traffic on traffic safety continue to have a moderate impact. Due to the limited traffic flow, emission release will become localized and this may cause moderate problems in respiratory disease for residents living in the surrounding area. Besides traffic, the influx of employees and visitors in the industrial area is expected to create more

constraints in the already challenging parking situation; currently, visitors and employees double park or park on curbs because of the limited amount of parking spots. None of the impacts during operation can be reduced to negligible with the proposed management measures. Because traffic flow, traffic safety and parking will remain a serious issue on the proposed OTA location, it is recommended to look for alternative locations to minimize the long-term social impacts.

1 Introduction

1.1 Background of the project

The Surinamese Government is facing an asthenic fiscal stance that stunts economic growth. The problem is accentuated by the country's vulnerable position to external macroeconomic conditions. In the period 2011- 2015, declines in the prices of the main commodity exports dwindled away the country's fiscal position due to sliding tax revenues. Contractionary fiscal adjustments fell short of expectations, resulting in historic lows on public investment and giving rise to spiraling public debt and mounting fiscal deficits.

Since 2011 the government has been strengthening its fiscal stance. As part of this ongoing effort, the Inter-American Development Bank (IADB) has been supporting the authorities through the Fiscal Strengthening for Economic Growth (FISEG) Program which objective is to support the Government of Suriname's efforts at achieving fiscal sustainability and economic growth by strengthening the Ministry of Finance's institutional capacity to effectively: a) collect tax revenue; b) improve quality of expenditure and; c) strengthen the monitoring and evaluation of the SOEs.

The specific objectives of the Program are: to increase indirect tax revenue and to improve the quality of expenditures by strengthening the budgetary process through the strengthening of the Office of Tax Administration (OTA) including Customs; establishing a Procurement Department and building a modern Treasury Department to combine the treasury functions currently being carried out by different institutions. Therefore, two new building sections of the OTA and the Customs will be built in Paramaribo.

In accordance with the Bank's Environmental and Safeguards Compliance Policy, an ex-ante environmental and social impact assessment should be undertaken. For that, the Bank has commissioned independent consultants. The study will be executed in accordance with the directives of the National Institute of Environment and Development in Suriname (NIMOS), and will seek to identify, reduce or avoid negative impacts and promote positive impacts to the local communities and environment.

1.2 Project Objectives

The current office facilities of Tax Administration as well as that of the Customs do not meet the standard requirements to provide efficient services. Moreover, the Ministry of Finance have to pay high rents for most of those offices. The government-owned offices such as the Head office of Tax Administration at Combé is due for renovation. The costs for a thorough renovation of this building will be very high. Therefore the Ministry of Finance decided to construct an office complex for the Office of Tax Administration and the Customs.

The overall objectives of the proposed OTA and Customs Building Project are to: 1) centralize most of the services of the Tax Administration for an effective execution of their tasks and to provide efficient services to the public, and 2) accommodate customs in their own facility that meets the contemporary requirements to improve their services.

1.3 Purpose of an ESIA

An ESIA is a systematic process to identify, predict and evaluate the environmental¹ effects of a proposed project. The purpose of an ESIA is to:

- Provide information for decision-making on the environmental consequences of proposed actions by identifying the potentially significant environmental and social effects and risks of a proposed project (i.e. ensure that environmental and social factors are considered in decision-making processes along with economic and technical factors²). This means that the outcome of an ESIA process provides advice to the decision-makers, and is not a final decision; and
- Promote environmentally sound and sustainable development through the identification of appropriate enhancement and mitigation measures.

Sustainable development has been defined in many ways, but the most frequently quoted definition is that of the Brundtland Commission³ :

¹ 'Environment' is used in the broadest sense, and is taken to include social and cultural aspects of the environment

² However, it is most important to recognize that ESIA cannot be regarded as a means of introducing an environmental "veto" power into administrative decision-making processes. Decisions that are unsatisfactory from an environmental point of view can still be made, but with full knowledge of the environmental consequences. The final decision about a proposal depends upon the likely severity of the adverse effects, balanced against other expected benefits.

³ WCED (World Commission on Environment and Development) (1987). Our Common Future (The Brundtland

Sustainable development is ‘development that meets the needs of today’s generation without compromising those of future generations’.

It is widely accepted that adverse environmental impacts of projects and development need to be prevented or minimized, and ESIA has become an important tool in achieving this through the integration of environmental and social considerations into proposed projects.

Recommendations made by an ESIA may necessitate the redesign of some project components, require further studies and/or identify modifications which alter the economic viability of the project or cause a delay in project implementation. To be most beneficial, an ESIA should be carried out as early in the project cycle as possible so that recommendations can be built into the design without causing delays and increasing cost.

An ESIA should also lead to a mechanism whereby adequate monitoring is undertaken to achieve effective environmental management of the project during implementation.

1.4 Purpose of this Document

The ESIA process is described in Chapter 3, and this ESIA Report provides an overview of the activities that have been undertaken in the ESIA process. The findings from the consultations with the stakeholders, literature review of available specialist studies, identification and assessment of potential project impacts and proposed mitigation measures are presented in this report.

The main purposes of this ESIA Report are to:

- Review Surinamese environmental and social requirements and legislation;
- Verify compliance of the project with the Environment and Safeguards Compliance Policy of the Bank – policy OP-703.
- Inform stakeholders about the results of the specialist studies;
- Describe the environmental and social aspects within the construction area and its surroundings;
- Identify and assess significant impacts associated with the proposed project;
- Provide an overview of environmental and social management plans to be implemented during the construction and operation phases of the proposed project.

1.5 Approach to the ESIA

The general approach to the ESIA has been guided by the principles of integrated environmental management and international best practice, modified where appropriate to reflect the scale of the project and other relevant factors (e.g. time constraints). More detail is provided in Chapter 2: Regulatory and Policy Framework and Chapter 3: The ESIA and Public Consultation Process. In accordance with this approach, the relevant underpinning principles are:

- Assessment based on available information;
- Accountability for information on which decisions are made;
- A broad interpretation of the term “environment” (inclusion of social and biophysical environment);
- An open and transparent but shortened participatory approach;
- Consultation with stakeholders;
- Consideration of alternatives, if applicable;
- An attempt to mitigate negative impacts and enhance positive impacts;
- An attempt to understand the social benefits of the proposed project;

1.6 Assumptions and limitations

The ESIA process and associated timelines described in this ESIA Report were subject to a number of assumptions and limitations, which should be considered when reading information presented in this report. The Consultants are confident that these assumptions and limitations do not compromise the integrity of the ESIA. Relevant assumptions and limitations are listed below:

- The ESIA process assumes that sufficient environmental data can be obtained by specialists to enable them to draft a defensible baseline description of the existing environment. It is expected that the existing information (reports / figures / legislation) is sent before the deadline for submission of the final report.
- The proposed program was dependent on the timely availability of the required, accurate project information to be provided by the Ministry of Finance and /or IADB, particularly with regard to project activities. A detailed list of information requirements was presented at the start of the baseline studies and was updated during the process. However, in practice it seemed to be a challenge. The location was changed during the study and no accurate

information about the project plans was available. The issue with regards to the ownership of the selected site still remains unsolved, as to date no official documentation has been provided by the Ministry of Finance. In addition, information about the current use, as well as future plans of the premises and the adjacent areas was provided by the Port Management Company. This was also presented during the stakeholders meeting.

- Consultation of stakeholders could only be done after accurate project information. Although not all project information was provided, the Consultants decided to start with the stakeholder consultations. However, much later than planned which resulted in a delay in the consultation round. A number of the remaining stakeholders were consulted during the period before submission of the final report. The stakeholders will have the opportunities to give comments during the Stakeholders meeting that is scheduled for 27 March 2017, as well as to the team by phone or email.
- It is not expected that NIMOS will be further involved in the finalization of the study as the Consultants continued the study without formal documentation on the appointed study site. The site is still a subject of concern; the Port Management Company currently is the owner of the land and they indicated that for strategic reasons (expansion of the port) the site will not be made available for the OTA construction project.
- The proposed program is dependent on a quick turn-around time for client review of documentation – a maximum of five working days are allowed for reviews.
- This report is written for the application process of the loan and shall be used in that matter.

1.7 Structure of the Final ESIA Report

This report describes the proposed activity, provides a description of the affected environment, details the public consultation undertaken to date, identifies and assesses the potential environmental and social impacts of the project and makes recommendations for mitigation measures. The report consists of the following chapters:

Chapter 1: Introduction

Provides an introduction and the motivation for the proposed project, explains the purpose of this report and gives an overview of the approach to the ESIA.

Chapter 2: Legal and Institutional Framework

Provides an overview of the legal and regulatory framework for the OTA Building Project and discusses the requirements for this ESIA.

Chapter 3: The ESIA and Public Consultation Process

Provides an overview of the ESIA and public consultation process followed, and discusses the key issues identified during consultation.

Chapter 4: Site and Project Description

Describes the proposed activities assessed in the OTA Building ESIA.

Chapter 5: The Affected Environment and Baseline

Describes the receiving biophysical and socio-economic environment that was considered in the assessment of the potential impacts of the proposed project.

Chapter 6: Impact Assessment and Overview of Management Plans

Identifies and assesses potential impacts associated with the proposed project and recommends mitigation and optimization measures. In addition, a brief evaluation of the key risks associated with the project is provided, followed by an overview of the Management Plans

Chapter 7: Conclusions and Recommendations

Concludes the ESIA Report with a discussion of important aspects of the assessment and provides an overview of the principal findings and summary impact evaluation. Recommendations are provided in the form of mitigation and optimization measures.

2 Legal and Institutional Framework

2.1 Introduction

In accordance with the Bank's Environmental and Safeguards Compliance Policy, an ex-ante environmental and social impact assessment should be undertaken for Construction and Operation of the Office of Tax Administration Building. This undertaken is required to follow Suriname's national environmental as well as occupational health and safety related policies, legislation, and institutional framework and the environmental and social safeguards of the IADB. In addition, the World Bank standards will be applied as best practice guidelines where the national legislation is absent. This chapter provides an overview of the policies, legislation and institutions that form the enabling environment of the project.

The Development Plan (current version 2012-2016) forms the overarching planning and policy document for the development of the country in the widest sense. The next development plan 2017-2021 has been formulated and the process has started to reach the parliament through the appropriate channels. The development Plan 2012-2016 which is still in force, emphasizes that a responsible environmental policy will be implemented. This policy will consider all the risks that may arise from, amongst others, climatic changes and risks resulting from improper use of the soil and nature. Aspects that will receive particular attention are:

- a. Waste management;
- b. Chemicals management;
- c. Renewable energy;
- d. Atmosphere protection;
- e. Sustainable water, nature, land and forest management;

2.2 Legal Framework

Suriname's legislation is exercised through a suite of different legislative instruments, including Laws or Acts of Parliament (*Wet, also called Landsverordening prior to 1975*), Decrees⁴ (*Decreten*), and regulations which are in the form of State Orders (*Staatsbesluiten*), Presidential

⁴ Decrees date from the Period of Military Ruling (1980-1986) and have the same status as a law.

Orders (*Presidentiele besluiten*), Presidential Resolutions (*Presidentiele Resoluties*) and Ministerial Orders (*Ministeriele Beschikkingen*).

The legal basis for environmental protection in the Country is provided by the Constitution (1987, last amended in 1992). It is stated that one of the social objectives of the State is directed towards “*The creation and promotion of conditions, necessary for the protection of nature and for conservation of the ecological balance*” (article 6g).

Despite this constitutional provision, Suriname’s environmental regulatory regime has not fully evolved. The current legislation stems from the Colonial period and is more focused on nature conservation rather than pollution control. The legislation includes, amongst others, the Nature Conservation Act 1954, Game law 1954 and Fisheries Act 1961. After independence in 1975, several new laws were promulgated with the aim to regulate exploitation of the natural resources of the country and not environmental management in particulars’. Examples are the Mining Act of 1986 and the Forestry Act 1992. In general, the legislation regarding environmental and natural resource management is fragmented, dispersed between different pieces of legislation.

Responsibility for the management of the environment and natural resources resides within different government institutions whereas there is a lack of coordination and enforcement.

In this light, in 1998, the National Institute for Environment and Development in Suriname (NIMOS) was established with a mission to initiate the development of a national legal and institutional framework for environmental policy and management in the interest of sustainable development in the Republic of Suriname. It was in the year 2000 when NIMOS started the process to develop an Environmental Framework Act for Suriname. A first draft was formulated in 2002 and afterwards revised several times. Even Environmental Impact Assessment and Pollution Control regulations were drafted. However, these were never promulgated. Environmental Assessment Guidelines have been released by NIMOS in 2005 and revised in 2009, and ever since been implemented on a voluntary basis by mostly Multi-nationals operating in the country and by State owned companies.

It is noteworthy to mention, that NIMOS has recently updated the Draft Environmental Act and is in the process of formulating the implementation regulations. It is the intention of the Government to start the process for submission of the Bill to Parliament soon⁵.

⁵ Personal Communication with NIMOS Legal advisor, G.Griffith, dd 10 March 2017

The Environmental issues to be dealt with in the current project are regulated under:

- i) The Building Act and the State Order on Building. This legislation provides for the control of Construction of Buildings through a permitting system. The regulations outline the technical requirements for building structures and specific rules concerning the setting up of latrines and septic tanks and the discharge of wastewater. The Ministry of Public Works, Transport and Communication is responsible for enforcement of this Act.
- ii) The Penal Act and Police Criminal Act which are both criminal acts penalize water pollution and littering. The Ministry of Justice and Police is responsible for its enforcement.
- iii) The Nuisance Act aims to prevent the cause of danger, damage or hindrance caused by undertakings (enterprises) to the outside-fence surrounding environment. The District's commissioner is responsible for enforcement.

The Occupational Health and Safety legislation applicable to the project are:

- i) The Safety Act 1947 which is a framework act on safety and hygiene in enterprises. Detailed rules are laid down in subsidiary legislation. At present, there are 9 Safety regulations pursuant to the Safety Act. The Act and the regulations aim to decrease the chances of employment injuries and occupational diseases. They provide specific rules regarding safety on the work floor. Enforcement of the aforementioned laws and regulation is a responsibility of the Ministry of Labor. Suriname is a member of the International Labor Organization (ILO) and has ratified several conventions related to workmen's compensation, safety standards for construction, and labor inspections⁶.
- ii) The Building State Order specifically provides occupational health and safety rules for workers in the construction sector.
- iii) The Accidents Act regulates that all employers are obliged to insure employees against accidents related to the work.
- iv) The Act on Driving as well as the State Order on Driving provide rules for participation in the vehicular traffic. This legislation provides, amongst others, for rules regarding loading and unloading of cargo on public roads, transportation of large cargo and it prohibits nuisance caused by motor vehicles.

⁶ Personal Communication with Inspector General / Head of Medical Bureau of the Ministry of Labor, dd 16 March 2017

In addition, there are several laws and regulations to maintain order and security in the ports managed by the Port Management Company (*NV Havenbeheer*).

- i) Harbour Decree 1981 which provide rules for the port sector.
- ii) Act and the Maritime Security which provides rules for ship and port security

In addition, the Company has its own regulations such as the Rules of maintaining order and security.

The international rules of the International Maritime Organization (IMO) will apply to the ports of the Port Management Company Suriname. These also include SOLAS and its amendments as the IMDG. The ILO code of practice on safety and health in ports shall also apply.

Various pieces of legislation related to Environment, Health and Safety are required to be complied with during both the construction as well as the operational phase of the project. Appendix 1 provides an overview of these legal instruments. This list does not intend to be definitive or exhaustive, but serves to highlight the key obligations only.

2.3 International Best Practice Standards

Where national legislation, standards or guidelines are lacking, international standards like the IFC World Bank standards are applied where applicable. As the project is financed by the IADB, the IADB Environmental and Social Safeguard Policies and Directives will be used to guide the project.

The World Bank Sourcebook for Environmental Assessment should be used as a guidance document for this study. The Sourcebook is a reference document that provides practical guidance for identifying and addressing negative environmental impacts of development projects. The Sourcebook aims to collect all World Bank policies, procedures, guidelines, precedents and best practice that reside in different World Bank publications into a single source. The document is continually updated and covers a wide range of subjects.

It is recommended that for the current project, the *IFC⁷ Environmental, Health and Safety Guidelines developed for Construction and Decommissioning* are used in the absence of national legislation. The hazards and risks associated with the project will be held against this standard. Where Suriname's legislation is absent or differs from the levels and measures presented in the EHS Guidelines, it is recommended to use the most stringent standard or guideline.

The EHS Guidelines for Construction and Decommissioning include information relevant to the management of EHS issues. The environmental issues associated with construction and decommission projects include Noise and Vibration, Soil Erosion, Air Quality, Solid Waste, Hazardous Materials, Wastewater Discharges and contaminated land. The associated occupational Health and safety issues include over-exertion, and ergonomic injuries and illnesses, slips and falls, Work in Heights, Struck by Objects, moving machinery, dust, Confined Spaces and Excavations. In addition, the guideline recommends to implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning. Traffic Safety and disease are included as associated issues.

The EHS Guideline recommends a number prevention and control measures which, if applicable, can be included in the Environmental Management and Monitoring Plan which is part of current study.

⁷ On the 2th of September 2011 Suriname became a member of the IFC. Suriname is the 14th Caribbean country who joins IFC.

The IFC Performance Standards will also guide the project where relevant and feasible. For current project, the following standards are applicable:

- PS 1 Social and Environmental Assessment and Management Systems

This standard requires the identification and assessment of all social and environmental impacts and risks in a project's area of influence. It aims to avoid, or where avoidance is not possible, minimize adverse social and environmental impacts and to ensure that affected communities are appropriately engaged. The Standard promotes the use of management systems to improve social and environmental performance.

- PS 2 Labor and Working Conditions

This standard aims to establish, maintain and improve worker-management relationships through fair treatment of workers and compliance with national labor and employment laws. It aims to prevent unacceptable forms of labor, e.g. child and forced labor and promotes safe and healthy working conditions. The Standard addresses issues such as human resources policy, non-discrimination and equal opportunity, retrenchment, occupational health and safety, contract labor, etc.

- PS 3 Pollution Prevention and Abatement

Application of the principles of the World Bank's Pollution Prevention and Abatement Handbook at Policy level is addressed by this standard which aims to avoid or minimize pollution from project activities. Key issues addressed include resource conservation and Energy Efficiency, hazardous materials, waste management, emergency preparedness and Response, ambient and cumulative considerations, greenhouse gas emissions, pesticide use and management.

- PS 4 Community Health, Safety and Security

The objective of this standard is to minimize and manage health and safety risks to local communities from project related activities. Issues addressed entail infrastructure and equipment safety, hazardous material safety, environmental health and natural resources issues, communicable diseases, emergency preparedness and response, and security personnel.

IADB Environmental and Social Safeguard Policies and Directives OP-703.

From an environmental standpoint, the Bank has a threefold strategy for addressing environmental concerns: These are:

1. To enhance long-term development benefits to its member countries by integrating environmental sustainability outcomes in all Bank operations and activities and

- strengthening environmental management capacities in its borrowing member countries;
2. To ensure that all Bank operations and activities are environmentally sustainable as defined in its Policy, and
 3. To foster corporate environmental responsibility within the Bank.

The Bank seeks to act to achieve these specific objectives by adopting measures to mainstream the environment into overall economic and social development, and to safeguard the environment in all Bank activities. Additionally, the Bank's Environmental and Safeguards Compliance Policy (OP-703 GN-2208) states that "the Bank will proactively support borrowing countries and clients in identifying and financing operations designed specifically to: (i) enhance environmental governance, policy development and institutional capacity building; (ii) reverse environmental deterioration; and (iii) promote the conservation and sustainable use of natural resources and ecological services."

To fulfil this mandate, the Bank has identified 3 categories of projects. These are: (i) Category A – Operations that are likely to cause significant negative environmental and associated social impacts, or have profound implications affecting natural resources, (ii) Category B – Operations that are likely to cause mostly local and short-term negative environmental and associated social impacts and for which effective mitigation measures are readily available, and (iii) Category C – Operations that are likely to cause minimal or no negative environmental and associated social impacts.

According to the IADB's Policy OP-703, this operation is a Category "B" with largely moderate environmental and social impacts. The construction of a new building at the Nieuwe Haven Complex, which is an industrial area where there has already been built before, is likely to cause mainly localized and short-term environmental and social impacts for which effective, standard, and easily implementable mitigation measures exist. During the operation phase, the facility will generate waste and create traffic congestions, which are likely the most sensitive environmental and social issues of concern for this Project.

To comply with the IADB's Directive B.05, the Project will develop an Environmental and Social Analysis (ESIA) and an Environmental and Social Management Plan (ESMP), through which risks, impacts and mitigation measures will be identified.

2.4 Relevant International Conventions

Suriname is signatory to several international agreements and conventions related environmental management as well as to Occupational Health and Safety conventions. As the selected site is situated in or adjacent to a Port Facility, the Conventions and protocols related to Port Security will be included. These conventions provide the direction for the national policy to be implemented by the Government. Table 1 provides a listing of the Conventions which are considered relevant to the current project.

Table 1 - Overview of Conventions relevant to the Project.

Environment	
Title of the Convention	Purpose
United Nations Convention on Biological Diversity 1992	The conservation of biological diversity (or biodiversity); the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources
United Nations Framework Convention on Climate Change 1994	To stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Under the Convention, both developed and developing countries agree to take measures to limit emissions and promote adaptation to future climate change impacts; submit information on their national climate change programs and inventories; promote technology transfer; cooperate on scientific and technical research; and promote public awareness, education, and training.
Kyoto Protocol 1997	<p>The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets.</p> <p>Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."</p>

Vienna Convention for the Protection of the Ozone Layer 1985	To protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer. To promote international cooperation in the legal, scientific and technical fields, and encourage the exchange of information
Montreal Protocol on Substances that deplete the Ozone Layer 1989	To protect the Ozone layer by phasing out the production of numerous substances that are responsible for Ozone depletion
Stockholm Convention on Persistent Organic Pollutants 2001	<p>To protect human health and the environment from POPs. POP is the abbreviation for 'Persistent Organic Pollutants', or a collective name for various, often toxic chemical compounds. With persistent is meant not or poorly biodegradable. These POPs are distributed worldwide and accumulate in the fat of living organisms and are toxic to humans and animals.</p> <p>By implementing this treaty countries will take measures to eliminate or reduce the spread of POPs in the environment</p>
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 1989	The treaty aims to protect the human health and the environment through minimization of the generation of hazardous waste and other materials where possible. The Convention also aims to further remove the waste as close to the source of origin or process to minimize the amount of hazardous substances and their danger and to limit their movement across international borders
Labor, Health and Safety	
Constitution of the International Labor Organization	Promotes opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and human dignity
ILO Code of Practice	Promotes Safety and Health in Ports
Constitution of the Pan American Health Organization	To improve health and living standards of the Countries of the Americas
Constitution of the World Health Organization	The attainment of People of highest possible level of health
Security	
International Convention for the Safety of Life at Sea (SOLAS),	to specify minimum standards for the construction, equipment and operation of ships, compatible with their

1974.	safety
The International Ship and Port Facility Security Code (ISPS)	provides a comprehensive set of measures to enhance the security of ships and port facilities

2.5 Institutional Framework

Several government departments and agencies play a role in environmental management in Suriname. This results in fragmentation and insufficient coordination. Within this section only the main entities are discussed and their relevance to environmental, occupational health and safety is highlighted.

A National Council for the Environment (NMR) was established in 1997 as an advisory body to the government and consists of 5 members appointed by the president and five members representing the trade and industry, unions, Amerindian and Maroon communities and consumer organizations. Currently, the Council is inactive⁸. The National Institute for Environment and Development in Suriname (NIMOS) was created in 1998 to support the NMR in implementation and research and to create national framework for environmental policy and management. NIMOS's current activities include review of environmental and social impact assessments of proposed projects, environmental monitoring and enforcement of environmental mitigation plans, and education and outreach. NIMOS is also involved in grant-funded projects related to the environment⁹.

An Environment Section was later created in the Ministry of Labor, Technological Development and Environment (ATM), which was converted to a Directorate in 2011. NIMOS worked under this Directorate. In 2013, the Directorate was removed from the Ministry and a National Environmental Policy Office was created in the Cabinet of the President, which also was to oversee NIMOS. The Policy Office did not become operational until late 2015¹⁰. The Office is responsible for formulating and coordinating environmental policy and environmental legislation and serves as the environmental focal point, representing the country in the various environmental

⁸ Personal Communication with the Director of NIMOS, Cedric Nelom, dd 19 March 2011.

⁹ Sandra Whiting, Environmental and Social Analysis Suriname, Agricultural Competitiveness prepared for the IADB and the Ministry of LVV, 2016.

¹⁰ Ibid.

conventions it is party to. While officially, NIMOS, under the direction of the National Environmental Policy Office, there is apparently little coordination between the two entities¹¹.

Additional environmental management activities and policies are under various ministries. The Ministry of Physical Planning, Land and Forest management is responsible for the issuance of Domain Land, physical planning, nature conservation and forest management.

The Ministry of Natural Resources is responsible for water resources policy, drinking water supply, energy resources, and mineral resources. The Geological Mining Division (*Geologische Mijnbouwkundige Dienst*) is responsible for monitoring of mining licenses.

The Ministry of Public Works, Transport and Communication is responsible for Policy, planning and development of general architectural structure, and other civil engineering infrastructure, flood control and drainage, surface water and urban drainage, hydrological and meteorological monitoring, and manages sewage treatment, technical provisions for traffic and public transport as well as management of all harbors.

The Port Management Company (*NV Havenbeheer*) is responsible for the management of the New Haven (Port of Paramaribo), the oil jetty and the harbor of New Nickerie. The Company is the "landlord", which provides port infrastructure, regulations and meets international standards. The processing of cargo is an exclusive activity of private terminal operators. As set put in the statutes, the Company operates only in the "dry" port infrastructure¹².

In the environmental arena, the Ministry of Health¹³ is responsible public health in the broadest sense and monitor the protection of public health, in particular, health information and education and for regulating medical waste management.

The Ministry of Agriculture, Animal Husbandry and Fisheries is responsible for pesticide management, including imports, distribution, storage and use.

In the arena of Occupational Health and Safety, the Ministry of Labor plays a major role. The labor Inspection is responsible for the monitoring of the legislation on Occupational Health and Safety

The permits required for the current project are listed in Table 2.

¹¹ Ibid.

¹² www.havenbeheer.com

¹³ Sometimes referred to as Public Health.

Table 2 - Overview of various permits required for current project.

PERMIT	RESPONSIBILITIES
	MINISTRY OF PUBLIC WORKS, TRANSPORT AND COMMUNICATION
Building Permit	<p>The Director of the Ministry of Public Works is responsible for issuing Building permits</p> <p>The Department Building and house supervision (Bouw en Woningtoezicht) is responsible for monitoring.</p> <p>Other government agencies are involved in the permitting process by providing advice. These include the Labor Inspection, the Fire Department, and the Bureau of Public Health.</p>
Parking Permit	The Ministry of OW is responsible for the issuing of permits for establishment of parking facilities for Office Space. The Traffic department has developed norms for the number of parking spaces.
Authorization to place culverts and bridges	The Department for Wet Civil Technical Works is responsible for the monitoring
Parceling Permit	The Minister issues a parceling permit ¹⁴ and the Planning Service is responsible for monitoring in the field.
Ministerial Order to place the land at the disposal of the Ministry of Finance	The Minister of ROGB is responsible the issuance of Domain land. For current project, it is required that land is being placed at the disposal of the Ministry of Finance for building purposes.
Permit for longer working hours	Ministry of Labor and the Head of Labor Inspection have the authority to sanction longer working hours than prescribed by law
Permit for equipment	The Director of Labor issues inspection permit for the use of certain equipment like cranes. Re-inspection can be demanded.
Environment and Social Impact Approval	NIMOS provides guidance in the ESIA process. It is on a voluntary basis as it is not legally binding.

¹⁴ A parceling permit is required when NV Havenbeheer decides to divide the area and to cede the relevant section to the Ministry of Finance

3 The ESIA and Public Consultation Process

3.1 General Approach to the ESIA

The general approach to the ESIA has been guided by the principles of integrated environmental management and the Environmental Assessment Guidelines from NIMOS.¹⁵ This ESIA aims to predict future impacts of the project activities and will play an important role in shaping the ongoing minimization, management and monitoring of impacts. Equally important is the intention to ensure that planned construction activities are undertaken in accordance with environmental and social policies, legislation and standards outlined in Chapter 2.

In this respect, this ESIA aims to:

- Meet the requirements of the environmental regulations in Suriname;
- Be guided by the policies, guidelines and procedures of the World Bank Group (IFC Standards); and
- Be consistent with IADB's Policy OP-703

In accordance with the NIMOS' Guidelines, the approach to the ESIA comprises of several phases:

- Screening - the aim is to determine the extent of the assessment to be undertaken.
- Scoping - the objective is to identify key sensitivities and those activities with the potential to contribute to or cause significant impacts to environmental and socio-economic receptors and resources.
- Impact Assessment – this includes the baseline studies and the actual assessment of the impacts and mitigation.
 - i) Baseline Studies: These are undertaken to review and ascertain existing environmental and social conditions relevant to the project area and its surrounds and to highlight receptors and resources sensitive to potential impacts
 - b) Assessment of impacts and mitigation: the focus is to identify and evaluate the likely extent and significance of the potential impacts on identified receptors and resources against predefined assessment criteria, to develop and describe measures that can be taken to avoid, minimize, and reduce any adverse environmental and social impact.

¹⁵ Environmental Assessment Guidelines, Volume I : Generic, Second Edition: August 2009

- Environmental and Social Management Plans (ESMPs) – these plans allow for a system whereby mitigation and monitoring of environmental and social impacts is integrated with project implementation.

3.2 Overview of the followed ESIA Process

The main objectives of the current ESIA are to:

- Inform and obtain contributions from stakeholders, including relevant authorities and the public, and address their relevant issues and concerns;
- Document and contextualize the ecological baseline conditions of the study area and the socio-economic conditions of affected communities;
- Assess in detail the environmental and socio-economic impacts that may result from the project;
- Identify environmental and social mitigation measures to address the impacts assessed;
- Produce an Environmental and Social Impact Assessment report, and
- Develop an Environmental and Social Management Plan, based on the mitigation measures developed in the ESIA Report

This ESIA process started with the involvement of NIMOS. The Ministry of Finance sent a letter to NIMOS with a request for advice on the ESIA process. Based on the project information provided by the Ministry, a project screening was completed by NIMOS and subsequently a screening letter send to the Ministry. NIMOS categorized the project as a Category B path 2 project, for which a limited Environmental Assessment is required and an Environmental Management and Monitoring Plan. However, soon after the screening letter was received, the project site was changed and a new site was designated. This new site is located close (approximately 150 m) to the earlier site. However, an official letter with the coordinates of the new site yet has not been sent to NIMOS.

Due to the urgency of the project and the instructions given by the IADB and the Ministry of Finance, the study was continued for the new site without further instructions from NIMOS. However, as the new site is close to the original one, the screening advice received from NIMOS has been used to conduct this study.

The Environmental Assessment is carried out based on desktop studies and consultations with stakeholders. In addition to the baseline study, an environmental and social risk analysis was conducted which has resulted in an environmental and social management and monitoring plan.

3.2.1 Specialist studies

Several specialist studies were reviewed to identify the potential environmental impacts associated with the OTA Building project. These impacts have been identified based on:

- The preliminary understanding of the nature of the receiving environment;
- The preliminary understanding of the nature of the proposed project;
- The professional judgment of the consultants; and,
- Input from interviews and the scoping meeting.

The IADB has assembled a team of individual consultants to undertake the specialist baseline and impact assessment studies required to investigate the key anticipated issues resulting from the proposed project. However, due to the urgency of the project, field research of the environmental aspects was not required. Therefore, the environmental specialist study undertaken for this ESIA is predominantly based on information from existing sources. The specialist studies that were undertaken and their authors are indicated in Table 3

Table 3 - Proposed ESIA specialist studies and relevant specialists.

Specialist Study/Report	Specialist teams
Policy, Institutional, and Legal Framework	Nancy del Prado
Geology, Soils, and Ecology	Armand Moredjo
Surface and Groundwater	Armand Moredjo
Noise and Air Quality	Armand Moredjo
Environmental and Social Risk Assessment	Armand Moredjo & Gwendolyn Smith
Socio-Economic	Gwendolyn Smith

Specialists considered the significance of potential impacts associated with the project, rated according to the standard impact rating methodology (see section 3.2. below). Risk Disaster Management is also integrated in different environmental and social aspects of the study, and addressed by both the environmental and social experts.

3.2.2 Impact Assessment Methodology

For this study, a qualitative analysis was performed based on the social categories (all except PS3 and PS6) of the World Bank/International Finance Standard Corporation (IFC)¹⁶ standards used by international banks and finance institutions. An overview of these standards is presented in Table 4.

Table 4 - Overview of IFC standards

IFC Performance standard	
PS 1: Assessment and Management of Environmental and Social risks and Impacts	PS 1. Requires the identification and assessment of all social and environmental impacts and risks in the area where the project is implemented. The goal is to prevent and minimize the negative social and environmental impacts and ensure that affected communities are participating effectively.
PS 2: Labor and Working Conditions	PS 2. The goal is to document, maintain and improve the relationship between employee and employer through a fair treatment of employees and compliance with national labor laws.
PS 3: Resource Efficiency and Pollution Prevention	PS 3. Focuses on the implementation of the principles of the World Bank's Pollution Prevention and Abatement Handbook at policy level. The goal is to prevent or minimize pollutants resulting from the project activities.
PS 4: Community Health, Safety, and Security	PS 4. Aims, wherever possible, to minimize and manage the health and safety risks of local communities related to the project activities.
PS 5: Land acquisition and Involuntary Resettlement	PS 5. Demands that the need for involuntary resettlement should be avoided or minimized and that the negative effects are mitigated by effective consultations and adequate compensation.
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	PS 6. Focuses on the protection and conservation of biodiversity and sustainable management of natural resources through the integration of needs for conservation and development priorities. The objectives of the standard are proposed elements of the Convention on Biological Diversity.
PS 7: Indigenous Peoples	PS 7. Promotes respect for the dignity, human rights, aspirations, cultures and customary livelihoods of indigenous

¹⁶ http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Documents.pdf?MOD=AJPERES

	peoples and; Requires that adverse effects on the communities of indigenous peoples are avoided; mitigated or compensated in a culturally appropriate manner.
PS 8: Cultural Heritage	PS 8. Focuses on the preservation and protection of the cultural heritage from the negative effects of the project activities.

The significance of all potential impacts that would result from the proposed project is determined to assist managers.

Further studies will be required to address the identified key issues, to determine whether they are likely to occur and to assess how they will manifest themselves.

For key potential impacts identified by the scoping study, it was necessary to determine the significance of each impact, based upon qualitative or quantitative assessment of the following attributes:

- magnitude
- geographical scale
- duration
- probability of occurrence

The resulting impact was indicated by their significance class, which classes are defined as:

< Impact significance >
Major (significant) effect: effect expected to be permanent or continuous and non-reversible on a national scale and/or have international significance.
Moderate (significant) effect: long-term or continuous effect, but it is reversible and/or it has regional significance.
Minor (not significant) effect: effect confined to the local area and/or of short duration, and it is reversible.
Negligible (not significant) effect: effect not detectable.
Unknown effect: insufficient data available to assess the significance of the effect.

In addition, impacts have been classified as

- positive: indicating whether the impact will have a positive (beneficial) effect; or
- negative: indicating whether the impact will have a negative (adverse) effect on the environment, including affected people

The degree of detail enabled the determination of required mitigation and possible enhancement measures, respectively to prevent or reduce significant negative impacts and to promote any positive impacts already in the planning phase. The implementation of mitigation measures will reduce negative environmental impacts to an acceptable level.

After implementation of mitigation/enhancement measures the significance of the impacts again was determined.

The impact assessment methodology is described below.

The **significance** of an impact is defined as a combination of the **severity** of the impact occurring and the **probability** that the impact will occur. The significance of each identified impact was rated per the methodology set out below:

First the **intensity/magnitude/size, scale** and **duration** of the impact were determined according to Table 5 & Table 6 & Table 7).

Table 5 - Defining the intensity / magnitude / size of the negative impacts

Rating	Description of Rating for		
	Natural environment	Socio-cultural	Health/safety
High	Irreversible damage to highly valued species, habitats or ecosystems	Irreparable damage to highly valued items of cultural significance, or social functions or processes are severely altered	Event resulting in loss of life, serious injuries or chronic illness; hospitalization required
Medium	Reversible damage to species, habitats or ecosystems	Repairable damage to items of cultural significance, or impairment of social functions and processes	Event resulting in moderate injuries or illness; may require hospitalization
Low	Limited damage to biological or physical environment	Low-level damage to cultural items, or social functions and processes are negligibly altered (nuisance)	Event resulting in annoyance, minor injuries or illness, not requiring hospitalization
Negligible	No relevant damage to biological or physical environment	No damage is done to cultural items and social functions and processes are not altered	Event is not experienced by receptors or only occasional minor annoyance

Table 6 - Defining the intensity / magnitude / size of the positive impacts

Rating	Description of Rating for		
	Natural environment	Socio-cultural	Health/safety
High	Direct benefits to species, habitats and resources with significant opportunities for sustainability	Benefits to local community and beyond	Health and safety will be significantly improved
Medium	Moderate benefits to species, habitats and resources with some opportunities for sustainability	Benefits to many households or individuals	Health and safety will be improved
Low	Minor benefits to species, habitats and resources with possible opportunities for sustainability	Benefits to few households or individuals	Health and safety will be slightly improved

Table 7 - Defining duration and scale of the impact

Rating	Definition of Rating
<i>Duration – the time frame for which the impact will be experienced</i>	
Short-term (ST)	Up to 1 year
Medium-term (MT)	1 to 10 years
Long-term (LT)	More than 10 years
<i>Scale – the area in which the impact will be experienced</i>	
Small (SS)	Localized spot
Medium (MS)	Part of study area
Large (LS)	Study area or beyond

Then, the **Severity Rating** of the impact was determined by combining the **magnitude** of the impact with **duration** and **scale** of the impact (Table 8) as set out below.

Table 8 - Determination of the Severity Rating of the impact

<i>Magnitude</i>	High	Medium	Low	Negligible
<i>Duration and/or Scale</i>				
LT-LS, LT-MS or MT-LS	High	High	Medium	Negligible
LT-SS, MT-MS, MT-SS, ST-MS or ST-LS	High	Medium	Low	Negligible
ST-SS	Medium	Low	Negligible	Negligible

The next step was to define the **probability** of an impact to occur, as defined below (Table 9).

Table 9 - Defining the probability of the impact

<i>Probability– the likelihood of the impact occurring</i>	
High	Sure to happen, or happens often
Medium	Could happen, and has happened in Suriname
Low	Possible, but only in extreme circumstances

Finally, the overall **significance** of the impact was determined as explained below (Table 10).

Table 10 - Determination of the overall Significance of the impact

<i>Severity</i>	High	Medium	Low	Negligible
<i>Probability</i>				
High	Major	Moderate	Minor	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Major	Minor	Negligible	Negligible

3.2.3 Mitigation

A key objective of the ESIA is to identify measures to avoid unnecessary damage to environmental and socio-economic resources and receptors, safeguard important resources, natural areas, habitats and ecosystems and protect humans and their associated social environment. To do this, practical mitigation measures and management actions were developed based on the nature of the potential impacts to avoid, reduce, remedy or compensate where the status of such impacts is negative or

to enhance and improve the impact where it has a positive status. These mitigation measures were identified, developed and proposed in this report. In addition, these measures must be agreed with all parties before being finalized as commitments.

Major negative impacts are generally considered to be unacceptable and require mitigation (e.g. avoided, minimized, reduced or compensated for). For moderate negative impacts, the focus of specific mitigation measures is to reduce these to as low as reasonably practicable. Minor impacts can generally be controlled through the adoption of best practice management measures.

3.3 Stakeholders' Consultation

For the Environmental and Social Assessment, several stakeholders were informed and their perceptions about the new construction heard. The study team – social expert – identified the stakeholders in primary and secondary stakeholders (Appendix 2) based on their potential stake in the new construction. Stakeholder meetings were held between 25 February and 20 March with primary stakeholders. Additional meetings were done in 27 March. The objective of the meetings was to provide details related to the project to the stakeholders and to receive feedback about issues which can guide the study team to assess the project and find effective and efficient solutions in pursuing this project.

Primary stakeholders were contacted by email with a formal letter from the Ministry of Finance and an information sheet (Appendix 3). Once an appointment was made, the study team (and assistant) interviewed the stakeholders. The interviews started with an explanation of the project's scope, after which the study team discussed environmental and social issues with a set of predetermined questions. Stakeholders were asked to explain their activities in the area, the potential impacts of the new construction on their operation, as well as in the wider area (study site), and potential solutions to identified concerns. Some of the question that were asked are shown below (Table 11).

Table 11 - Inquiries for primary stakeholders during consultation

Social Inquiry
<ol style="list-style-type: none"> 1. What activities do you engage in at the Nieuwe Haven complex? 2. What advantages and disadvantages do you have of being located at the Nieuwe Haven? 3. What types of peoples are visiting you? 4. What are the working hours of your operation? 5. What do you think about the safety in the area? 6. How would you describe your relationship with other in the area? Do you interact with them? 7. How would you be impacted by construction of the new building? Positive/negative 8. What should we take into consideration when constructing the buildings? 9. With two more buildings (one open to the public) in the Nieuwe Haven, what would be the effect on your activities?
Legal and Policy Inquiry
<ol style="list-style-type: none"> 1. What are the EHS Policy and Legal requirement relevant to the project? 2. Which Government institutions are responsible for enforcement and Monitoring? 3. Which permits are required for the project? 4. What are the requirements regarding Construction, Spatial Planning, Emergency Response, Traffic? 5. Which entity has the ownership of the projected area?
Environmental Inquiry
<ol style="list-style-type: none"> 1. How is your waste being handled? 2. Do you have any issues with flooding during spring tide and/or heavy rains? 3. Do you have any concerns regarding the increase of the traffic with the construction and operations of the OTA building? 4. Which kind of environmental risks do expect? 5. Will pile driving be a concern for your company? 6. Are you experiencing any nuisance during working hours?

The nearby residential areas, Beekhuizen and Abra Broki, were separately studied by the Social team. For this purpose, the team developed a qualitative survey instrument (Appendix 4) to better understand the characteristics of the neighborhood – quality of living, safety, mobility, and services, and the residents’ perception about the new building construction. Individual stakeholders were interviewed and the main themes were extracted and listed under the thematic

issues below.

Secondary stakeholders were informed with an information sheet developed by the Social expert. The study team delivered the information sheet to the physical address of these stakeholders. Secondary stakeholders could provide feedback by contacting the study team for questions, suggestions and comments by telephone or email. Unfortunately, no feedback from the secondary stakeholders were received.

Several issues were raised by the stakeholders (Appendix 5), which are thematically presented below.

a) Health and Safety

- Recently, a new Safety Act has been approved by Parliament, but this will only be in force after publication in the Government Gazette. It is therefore recommended by the Ministry of Labour to refer in this report to Health and Safety laws and regulation currently in force.
- The labor Inspection provides i) advice with regards to Health and Safety to Permitting Agencies in case of construction ii) in case of use of asbestos in e.g. cement boards, a labor inspection test of asbestos is necessary, iii) cranes need to be inspected when used for construction, iv) in case of longer working hours than 8.5 hours or Sundays/holidays, a permit is required from Labor inspection, v) in case of foreign contractors or employees, a permit is required.
- It is requested that contractors and subcontractors e.g. crane operators to be tested by the Labour Inspection if they are fit to do the job The Ministry of Labour refers to 4 specific occupational physicians ¹⁷who do the “Fit for Work” tests.
- During the Construction phase, it is expected that there will be a lot of dust nuisance for both the workers as the surrounding businesses.
- Health Risk for employees: The transport of hazardous goods near the project area and in a later stage the OTA building complex is a concern as it may pose a risk for the workers and employees in the event of an accident.

A stakeholder meeting was held on March 27 to present the findings of the ESIA report. The attendance

¹⁷ The four Occupational Physician are: Jan Van Charante, Lloyd Chin Kon Sung, Robby Ramlal and Mahinder Mangroo.

list of this stakeholders meeting is presented in Appendix 6 and the minutes in Appendix 7

b) Site Selection

- There is uncertainty about the legal status of the current site that has been selected for the proposed construction. At the time of the study, it became clear that the Port Management Company (NV Havenbeheer) is the owner of the property. They have indicated that for strategic reasons this part of the Harbour will not be issued. This issue¹⁸ now is being discussed at Ministerial level.
- There was uncertainty at the Ministry of Public Works about the legal status (private/public) of the only access road -Abattoir- to the site. However, field observations demonstrate that a security post, lever and signpost are present, indicating the road is a private road. The road is designated as property of the Port Authority.
- The site is a perfect location to house the Customs Department as it provides a good overview over their work area and better opportunities for boat inspections. A boat ramp is also necessary¹⁹.
- For some of the stakeholders it was uncertain whether the area is suitable for the Tax Office, while others like residents of Beekhuizen and Abra Broki were content with the location, as it would be a shorter distance to the Tax Office.
- The Building will be used for administrative services of both the Customs and the Tax Office and therefore opened for the general public which will result in an Influx of the public (for tax office). All consulted stakeholders considered the location suitable for the customs because it gives a clear sight to the harbour. As the customs also do ship inspections, the location at the river-bank enables the direct access to their boats. On the other hand, most of the stakeholders considered the construction of the Office of Tax Administration at the harbour area not suitable due to the traffic issues and the expansion plans of the Port Management Company.

c) Physical planning

- The Nieuwe Haven complex is currently used as an industrial area. Opening the new building to the general public poses a threat to the safety of both employees and visitors. The new

¹⁸ The issue of the legal status of the selected site will not be further discussed in this Study.

¹⁹ This was indicated during a meeting with the Staff of Customs on 10 March 2017

construction will also restrict further planned expansion of the port.

- In the expansion plans of the port (see Appendix 8), specific areas have been designated for different uses. These plans include a free zone with warehouses for the conversion of semi-finished products to end products; a zone specifically for storage of export timber; storage area for piping and other heavy equipment for the offshore oil Industry. Investments have been made for placing sheet piling for the construction of a third terminal at the port. The construction and operation of a non-port related office in that area will limit the further expansion for the Port.
- The area is unsuitable for a large office complex of 800-900 employees (visitors and clients not included) that provides services to the general public. There are specific requirements from the Ministry of Public Works regarding parking space and greening which need to be complied with.
- It is not recommended to make the area accessible to the public once customs permanently resides near the port.
- In case the Port Authority is required to cede land to the Ministry of Finance, the land needs to be divided for which a subdivision permit from the Ministry of Public Works, Transport and Communication is required.

d) Traffic

- Currently the Abattoirweg which is a private road, owned by the Port Management Company, is the only access road to the proposed project site.
- The access road is narrow (6m) and not designed to dispatch great amount of traffic. SOL has concerns with regards the trucks exiting their premises during the day. SOL alone counts for 30-35 trucks that are entering and exiting their premises daily, of which 4-5 are large trucks needing a lot of space turning into the access road. In addition, approximately 200 container trucks are leaving the Port through the Abattoirweg on a daily basis as well as an unknown number of passenger cars of employees and visitors of the companies and government agencies. This will have an impact on Road Safety if an additional 800 personal vehicles will use the same road.
- Additional access roads could be an option, however the whole area is property of the Port Management Company. A new road for public access will jeopardize the expansion plans.

- During construction, a lot of external transport trucks and heavy equipment will make use of the access road which may be challenging to the current users of the Road.
- After the construction, mixed traffic will use the access road (Trucks, motorcycles, bicycles, pedestrians, motor vehicles) which will become a safety issue.
- The access road already has a negative impact on the traffic light at Van 't Hogerhuysstraat/Willem Campagnestraat. The traffic light will be soon replaced. The crossing Van 't Hogerhuysstraat/Abattoirweg will be closed. However, this will place more pressure on the Roundabout. Currently, the Roundabout cannot handle the traffic. There is a lot of traffic congestion with traffic coming from the Bridge and from the south.
- According to the Traffic department of the Ministry of OWT&C, the Van 't Hogerhuysstraat already exceeds its capacity to process the traffic during peak hours (i.e. 6:00- 8:30 am, 12:00- 2:30 pm en 15:00-16:30 PM). During weekdays, the Police provides assistance in the morning to reduce the delays in traffic.
- An increase in vehicles that will enter the Abattoirweg from both north and south will lead to more traffic congestion.
- There will be an increase in the number of pedestrians which will impact the flow of traffic on the Van t Hogerhuysstraat, jeopardizing the traffic safety.
- Public transport needs to be facilitated. For example, an increased frequency of bus stopping will influence the traffic flow negatively.
- The increased number of vehicles as well as the increased duration of traffic jams will also have impact on the environment, e.g. more emission release, noise and vibrations. Therefore, it is necessary to create alternative roads. The Ministry of Public Works, the Road Authority and the Ministry of Justice and Police (Traffic Police) need to be closely involved in the project design phase.
- Residents from Abra Broki and Beekhuizen prefer the shorter distance to the tax office above increasing constraint in traffic flow.

e) Building construction

- Since the site is located close to the river and pile-driving is necessary for the construction, a geotechnical study will be required in order to select the pile driving technology and the number of piles.
- It is expected that much construction waste will be generated during construction. However,

no specific requirements from the Government exists with regards to handling of solid waste from construction sites. Waste management should be planned carefully.

- It is recommended that waste water flow is directed to the Suriname River through ditches with macrophytes to retain as much debris as possible.

f) Security

- Residents of Abra Broki and Beekhuizen have no concerns about safety associated with the influx of construction workers.
- The Port is ISPS (International Ship and Port Facility) certified which requires a comprehensive set of security measures. The Port is being audited on a yearly basis and security is always a high priority. ISPS Code provides minimum requirements for security of ships and ports. For this reason, there are stringent security rules for all individual entering the premises; the Abattoirweg is being secured by a security post and lever. Opening the Abattoirweg to the wider public will become a risk for security of the port.

4 Site and Project Description

This chapter provides a brief description of the site where the Office of Tax Administration and the Customs' Buildings will be constructed. The level of detail in the description provided here is based on the information available at the time of writing this report (20 March 2017) and focuses on those aspects that relate to the potential environmental and social impacts of the project. The description is not intended to be comprehensive.

4.1 Site Description

The area in which the buildings will be constructed is about 1.15 ha and is a government owned land that had previously been used as naval base. Nowadays, the site contains several buildings belonging to the Suriname Port Management Company. The area is located in an urban area on a site abutting to the Suriname River, which forms its eastern border. The new buildings will be constructed just about 20 m from riverbank.

In the south, the site is located adjacent to a vacant land, with the Wijdenbosch Bridge at approximately a distance of 250 m and the Beekhuizen residential area at a distance of 300 m.

The site is bordered to the west by the Van 't Hogerhuysstraat. This street has many commercial establishments on both sides of the road, and the Abrabroki residential area is located next to it.

To the northwest, the site is bordered by the Nieuwe Haven Complex with mainly commercial establishments (Figure 1).

The site is accessible by road, but may also be reached from the Suriname River by boats. However, there are no mooring possibilities present at the moment.



Figure 1 - Google Earth image showing the project site

The proposed project site is in one of the twelve ressorts of Paramaribo, named Beekhuizen. For the social baseline description, we incorporated the adjacent residential neighborhoods “Abra Broki” and “Beekhuizen” into the area of study (Figure 2). These neighborhoods are in the administrative ressort of Beekhuizen and pertain to the area of indirect impact of the OTA.

The area in the direct vicinity to the proposed project site is mainly characterized by commercial and industrial activities such as gas stations, office buildings and the harbor with its accompanied activities. The area in indirect vicinity to the project site is characterized by residential areas and areas containing a mix of residential and commercial activities (Figure 3).



Figure 2 - Ressort Beekhuizen with residential areas 'Beekhuizen' and 'Abra Broki'



Figure 3 - Land Use Map of Study site

4.2 Analysis of Project Alternatives

The identification and analysis of project alternatives in an ESIA aim to ensure that environmental and social considerations are incorporated into the first stages of development planning (e.g. site

selection, design and implementation) to facilitate the identification of the most cost-effective way of achieving the project objectives at lowest possible environmental and social cost.

Furthermore, the consideration of alternatives is also inherent in the detailed design of the project and the identification of mitigation measures in the ESIA process, and thus not all possible alternatives can be individually presented in an ESIA. Specific alternatives with relevance to the project are discussed below.

The current ESIA process for the proposed construction of the OTA and Customs Buildings take place in parallel with the basic engineering design phase. The results of the ESIA studies are also used to guide and formulate many aspects of the design. This facilitated a process of consideration and elimination of unfavorable or fatally flawed project (design) alternatives as well as the incorporation of mitigation measures into the design.

Alternative locations for the proposed OTA Building construction project have been discussed with the Ministry of Finance, the engineering firm, and the other stakeholders. There were other locations suggested²⁰ for further study:

- The Old Cemetery at Menckendam, which is no longer in use and based on the law can be closed. It is an area of 40 ha and the neighborhood no longer wants a cemetery. There are various access roads.
- The Former US Embassy Building. Negotiations must be held with the US Government. There is no information about the suitability of the Building for a Tax Office.
- There is a terrain of approximately 2.5 ha along the Jaggernath Lachmonstraat which was issued to the Embassy of India in 1993. It is noteworthy to mention that this Terrain has never been used.

For the current location which is subject of this ESIA, there are still some issues to be solved by the Ministry of Finance:

- There is uncertainty about the legal status of the site that has been selected for the proposed construction. During the execution of the study it became clear that the Port Management Company (NV Havenbeheer) is the owner of the property. They have indicated that for strategic reasons this part of the Harbour will not be issued. Now this issue is being discussed on Ministerial level.
- There was uncertainty at the Ministry of Public Works about the legal status (private/public)

²⁰ Personal Communication with the District's Commissioner Paramaribo North East, dd 15 March 2017

of the only access road -Abattoirweg- to the site. However, field observations demonstrate that a security post, lever and signpost are present, indicating the road is a private road. The road is designated as property of the Port Authority.

Some positive findings for the current location from the discussions with the relevant stakeholders are:

- The site is perfect location to house the Customs Department as it provides a good overview over their work area and better opportunities for boat inspections. A boat ramp is also necessary.
- For some of the stakeholders it was uncertain whether the area is suitable for the Tax Office, while others like residents of Beekhuizen and Abra Broki were content with the location, as it would be a shorter distance to the Tax Office.
- The site will be used for administrative services of both the Customs and the Tax Office and therefore opened up for the general public which will result in an influx of the public (for tax office).
- The site is easily accessible for staff and clients.

Technology or process alternatives for the OTA Building project have also been discussed with the engineering firm. The main concerns for using technology for pile driving was to reduce as much as possible the effects of noise and vibration to the surrounding infrastructure. Another main concern is the significant increase of traffic during the construction and operations phase. Results of the risk assessment of these aspects are discussed in Section 6.1.

The selected project site was indicated by the Ministry of Finance and is considered at the moment as the most suitable location for the construction of the OTA building complex.

Prior to the final decision whether to continue with the construction of the OTA building as described in section 4.3, or with adaptations as proposed in chapter 7, a number of considerations that are discussed in this ESIA report have to be taken into account seriously. In particular, the legal documentation with regards to the ownership of the site must be in order and available to the IDB.

4.3 Description of the Proposed OTA Building Project

The office complex will consist of 2 separate sections of buildings, one section for the Customs and the one for the Office of Tax Administration, constructed in an area of approximately 1.15 ha. As a total of about 800 people will have to work in the office complex, the only option is to have multi-storied buildings. Therefore, three-story buildings will be constructed with the possibility to extend to 4 to 5 stories, totaling a gross floor surface of approximately 12,000 m². It is intended to construct prefabricated modular buildings. A parking lot that meets the needs for the staff and clients will also be included.

As the project area is situated on the young coastal plain of which the soil predominantly consists of clay, pile driving will be necessary.

4.4 Water Supply

Water for the construction and operations phase is supplied by the Surinaamsche Waterleiding Maatschappij (SWM). During the construction phase, it is recommended to use portable water tanks (“Duro-tanks”) for storing water that will be used for washing purposes. These tanks will be supplied by water trucks. Mixing processes will be done off-site. For emergency response purposes, water from the Suriname can be used.

4.5 Energy Supply

The electrical power needed for the construction and operations phase will be supplied from the national grid (EBS), with a diesel generator as back up. However, the required electrical power for both phases is not yet calculated as the project design is not yet finalized.

On-site, diesel powered emergency power generators will be available to feed the electrical consumers with sufficient energy in the event of a power outage. Diesel to supply these generators will be stored on site in tanks with secondary containment.

4.6 Stormwater Management

Stormwater consist of runoff (rain) from areas where no contamination is likely (e.g. roads and construction area). The existing stormwater canal discharges into the Suriname River. This discharge canal should be well-maintained and should also contain macrophytes to retain as much sediment and solid waste as possible. Removal of retained waste from this canal would be more practical.

4.7 Waste Management

The waste reduction and management hierarchy that will be employed at the OTA Building project is as follows:

- Reduce;
- Reuse;
- Recycle;
- Landfill – final disposal of materials that cannot be economically or technically removed from the waste stream.

The aim of this approach is to minimise the amount of waste generated by applying waste reduction strategies, and then to maximise alternative uses of waste so as to minimise the amount of waste requiring final disposal.

Hazardous waste should always be handled and stored separately from general waste. Hazardous waste should be managed according to the following principles:

- The risks associated with handling hazardous waste should be understood;
- Employees must be trained in the appropriate handling, treating and disposing of hazardous waste; and
- Compliance with applicable local and international regulations must be ensured.

However, a severe constraint to the implementation of the waste management hierarchy is the rudimentary status of waste management in Suriname, with limited recycling options and no appropriately designed and engineered landfill sites.

During the construction phase, solid waste will be generated, consisting of office waste like coffee cups, paper and paper board and other domestic waste. In addition, the waste stream will include

packaging materials such as wood (pallets, transportation boxes) and plastic (films, bags, ropes), as well as excess and damaged construction materials. Efforts will be made to reduce the latter to minimise expensive wastage. It is difficult to estimate quantities of solid waste that will be generated during the construction phase as the design of the office complex is not finalized yet.

Hazardous waste may consist of:

- Lubricants and grease for the mobile equipment and power tools. However, this should be of very small quantities as maintenance of those equipment and tools will have to be done off-site.
- Soil contaminated with oil and grease, as result from eventual leakages and spills;
- Spent paints and solvents.

All non-hazardous waste generated will be taken to the public landfill at Accaribo. Wherever recycling opportunities are existing, for waste such as paper, pet bottles, metal scrap, etc., agreements with recycling companies should be made for the further handling.

Hazardous waste will primarily be stored on-site until a certain amount is reached that can be transported to Oil Mop (i.e. the nearby hazardous waste handler company). Depending on the type of hazardous waste Oil Mop will either incinerate it or contain it in controlled hazardous waste storage area.

4.8 Project Phasing

The project will go through a number of phases to more precisely determine costs and design:

- Basic engineering phase and ESIA process phase;
- Site preparation, including demolition of existing buildings, land clearing, and landscaping;
- The Engineering, Procurement and Construction contract phase;
- Commissioning and start up; and
- Full commercial operations.

4.9 Construction Phase Activities

Construction activities will take place on the old naval base area where nowadays some administrative activities of the Port Management Company are conducted, on the left bank of the Suriname River.

Construction activities will include:

- Site (vegetation) clearing, including demolition of existing buildings;
- Site preparation;
- Earthworks / excavation;
- Laying foundations, including piling;
- Concrete works;
- Installation of the equipment; and
- Construction of parking lot and rehabilitation/adaptation of access road.

Construction activities are expected to take place during daylight hours (7am to 7pm) on weekdays (Monday to Friday) over approximately 36 months. The number of piles to provide foundation support for the buildings and other facilities will be determined after the geotechnical study has been completed.

Vehicles and equipment that will be operated on site during the construction phase include:

- Trucks to transport materials;
- Cranes for lifting building materials
- Diesel pile hammers;
- Power generators;
- Welding equipment;
- Air compressors to power pneumatic equipment;
- Concrete mixers; and
- Elevators.

Supplies and materials needed during the construction phase include:

- Construction material such as steel, concrete, bricks, wood, plastics, electrical wires, etc.;
- Welding rods, gas cylinders (for steel welding and cutting), grinding discs, chemical cleaning materials (for degreasing and pickling), paints and coatings;

- Lubrication and greasing media for construction vehicles and installed rotating equipment, including flushing lube oil and first fills of lube oil sumps for compressors.

Supplies and materials for construction of the project will be sourced locally or internationally depending on availability. All materials will be transported by road via the Van 't Hogerhuysstraat. A vacant strip of land abutting the project site will be utilised as a construction laydown area during the construction period.

5 The Affected Environment and Baseline

5.1 Biophysical environment

5.1.1 Climate and air quality

Suriname has a typical tropical climate with high rainfall and high temperatures. Most rainfall in the region falls in two rainy seasons, interspersed with two ‘dry’ seasons as follows²¹ :

- Short rainy season – early December until early February;
- Short dry season – early February until mid-April;
- Long rainy season – mid-April until mid-August; and
- Long dry season – mid-August until early December.

Average monthly rainfall varies from more than 300mm in the long rainy season to around 100mm in the long dry season. Rainfall intensity is greatest in the long rainy season, when intensities of up to 70mm/hour are recorded over short periods of up to 15 minutes. Greater intensities have been reported but with longer return periods.

The monthly average rainfall recorded between 2009 and 2013 is presented in Table 12

Table 12 – Monthly average rainfall between 2009 and 2013²²

Maand	2009	2010	2011	2012	2013	Month
Januari	245.0	140.0	108.4	213.1	86.2	January
Februari	201.0	143.9	233.7	254.0	302.7	February
Maart	290.2	173.8	365.5	164.4	116.7	March
April	204.0	286.9	90.5	281.3	226.5	April
Mei	90.6	391.1	345.0	210.4	337.4	May
Juni	238.1	244.5	277.3	168.6	178.3	June
Juli	139.7	286.4	165.5	175.0	175.2	July
Augustus	63.0	217.7	97.5	147.6	169.2	August
September	36.8	101.0	65.1	27.9	64.5	September
Oktober	71.3	61.3	135.1	25.4	94.2	October
November	68.6	123.4	115.4	54.7	110.2	November
December	185.5	149.0	75.6	82.8	214.9	December
Totaal	1,833.8	2,319.0	2,074.6	1,805.2	2,076.0	Total

Bron/Source: Meteorologische Dienst Suriname / Meteorology Service Suriname

²¹ Webster, T. & Roebuck, L. (2001). Water Resources Assessment of Suriname. US Army Corps of Engineers: Mobile District and Topographic Engineering Center, Virginia, USA.

²² Data retrieved from: ABS, (Dec. 2014). Environmental Statistics

Temperatures generally vary between 23°C and 31°C with a mean daily temperature of approximately 27°C²³. January is the coldest and October the warmest month. Monthly average, maximum and minimum temperatures recorded between 2009 and 2013 are shown in Table 13.

Table 13 - Monthly average rainfall between 2009 and 2013²⁴

Maand/Month	2009	2010	2011	2012	2013
Januari/January	26.5	27.0	@27.6	^27.7	27.5
Februari/February	26.4	27.5	+26.8	^27.0	26.8
Maart/March	27.0	28.0	+26.8	27.1	27.5
April/April	27.1	27.8	+28.0	27.1	27.2
Mei/May	27.9	27.4	@28.0	27.2	27.0
Juni/June	27.3	27.7	+27.6	27.7	27.4
Juli/July	28.0	27.7	+27.7	27.7	27.5
Augustus/August	28.8	27.9	+28.6	27.9	27.9
September/September	29.4	28.7	+28.7	28.9	28.5
Oktober/October	28.3	29.1	+28.5	29.2	28.1
November/November	29.8	28.1	+28.4	28.8	27.6
December/December	27.0	27.9	+28.3	28.0	26.9

Bron/Source: Meteorologische Dienst Suriname / Meteorology Service Suriname

Humidity is generally high throughout the year, varying between 80% and 90% on the Coastal Plain and 75% in the Interior²⁵. The highest humidity values are recorded from May to July and the lowest from September to November. Annual average relative humidity recorded between 2009 and 2013 varied slightly between 75% and 84.9% (Table 14).

Table 14 – Relative humidity and Velocity at the Measuring stations Zanderij (J.A.P. Airport), Nickerie Airport (M.H.F. Airstrip) and Cultuurtuin, 2009 - 2013²⁶

RELATIEVE VOCHTIGHEID (%)	2009	2010	2011*	2012	2013	RELATIVE HUMIDITY (%)
Zanderij	78.0	79.0	83.8	82.9	84.9	Zanderij
Nickerie	80.0	80.0	.	81.0	80	Nickerie
Cultuurtuin	75.0	.	.	80.0		Cultuurtuin
WINDSNELHEID (m/ sec)						VELOCITY OF WIND (m/ sec)
Zanderij	2	2	1.4	4.6	4.8	Zanderij
Nickerie	3	3.0	.	2.6	2.9	Nickerie
Cultuurtuin	1	.	.	0.8	0.5	Cultuurtuin

Bron/Source: Meteorologische Dienst Suriname / Meteorology Service Suriname

²³ Webster, T. & Roebuck, L. (2001). Water Resources Assessment of Suriname. US Army Corps of Engineers: Mobile District and Topographic Engineering Center, Virginia, USA

²⁴ Data retrieved from: ABS, (Dec. 2014). Environmental Statistics

²⁵ Alcoa & CNEC (2005). Kabalebo Complex Environmental Studies Suriname. Avanavero – Tijgerval – Lucie/Kabalebo Canal – Corantijn. Phase 1 – Consolidation of Secondary Data. Executive Summary. January 2005.

²⁶ Data retrieved from: ABS, Dec. 2014, Environmental statistics.

Wind velocity data for 2009 till 2013 measured at Zanderij, Nickerie and Cultuurtuin shows an annual average between 0.5 to 4.8 m/s (Figure 4).

The dominant wind direction during the day is easterly, with north-easterly winds dominating at night. Calm conditions are more frequent at night (54.2%) than during the day (46.2%). Seasonal wind patterns show an increase in the occurrence of high wind speeds in the months March – May, and to a lesser extent in the months December – February. In the months June – August, there was an increase in calm conditions and south-easterly winds²⁷.

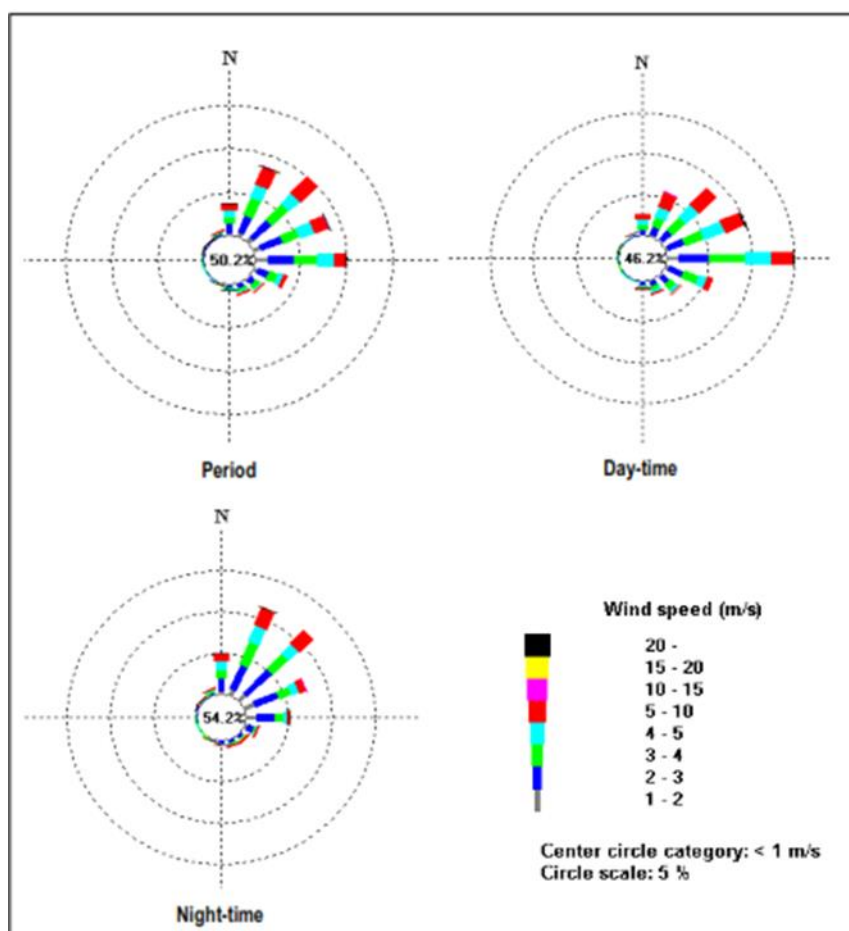


Figure 4 – Period, day and night-time windrose for 2006 and 2007 at the Zanderij International Airport²⁸.

²⁷ SRK Consulting (2010). Environmental Impact Assessment for the Staatsolie Refinery Expansion Project. SRK Project Number 398251. January 2010.

²⁸ Data retrieved from: Airshed Planning Professionals, (2009). Air quality impact assessment for the proposed expansion at Staatsolie Refinery, Suriname

5.1.2 Geology, geomorphology and topography

Suriname's Coastal Plain is flat to nearly flat and very low-lying. It is divided into the Young Coastal Plain, consisting of relatively young (Holocene) sandy and clayey marine deposits, and the Old Coastal Plain (older Pleistocene deposits). The three (youngest) sediments that crop out on the Coastal Plain belong to the following formations:

- Mara and Coronie Formations from the Holocene;
- Coropina Formation from the mid- to late Pleistocene; and
- Zanderij Formation deposited during the late Tertiary (Pliocene);

A north-south geological cross-section of Suriname is shown in Figure 5 (note the Mara Formation is not indicated).

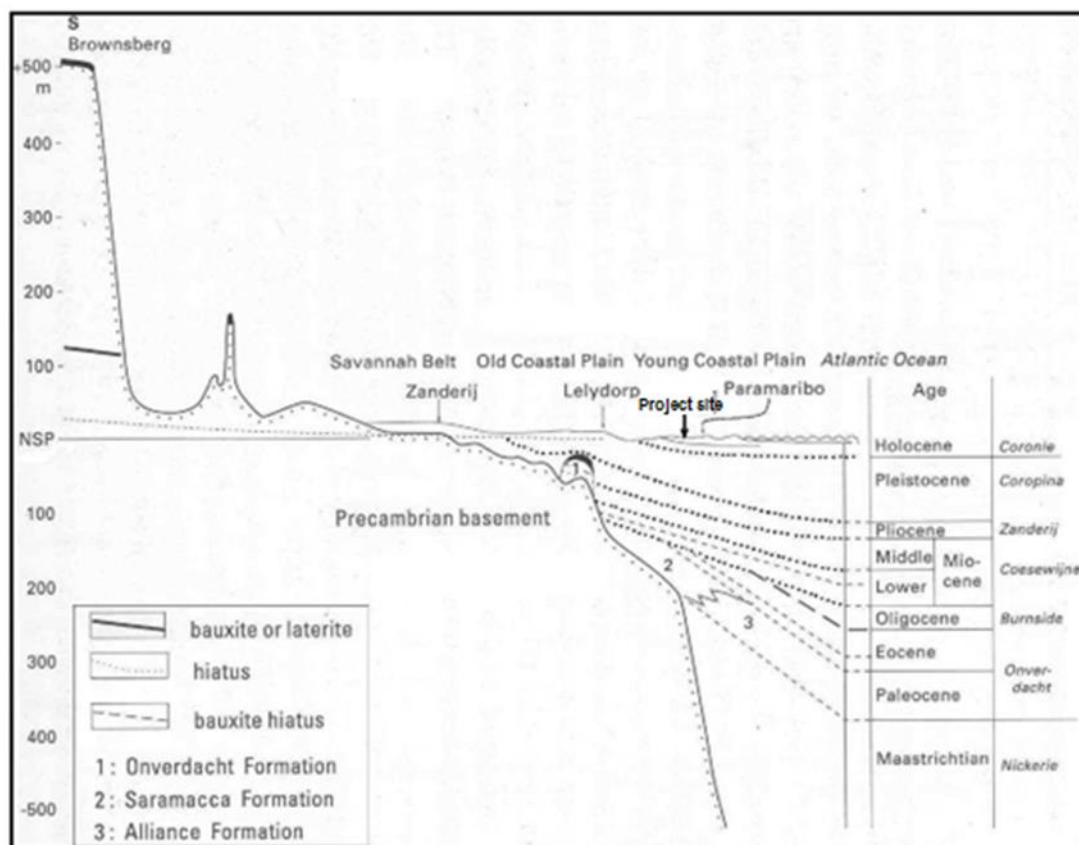


Figure 5 - Geological cross section through northern Suriname²⁹

²⁹Retrieved and modified from: Noordam & Teunissen (2009). Sediments and Geomorphology Baseline Study for SurinameRiver Dredging Project, in: SRK (2010). Environmental Impact Assessment for the Staatsolie Refinery Expansion Project Final Environmental Impact Assessment Report Volume 1 (Appendix C)

The project site is located on the Young Coastal Plain in an area classified as River Landscape, surrounded by marine sediments of the Kwatta Landscape. The River Landscape consists of tidal clayflats, i.e. an old tidal flat at approximately 1.5m above mean sea level (amsl) and a younger tidal flat (at 1-1.2m amsl), which is inundated during very high tides.

Originally, the clayflats of the River and Kwatta landscapes were covered by swamps, but these were reclaimed for the establishment of plantations and polders, with water management structures including canals, ditches and sluices (e.g. the Saramacca canal at more to the south of the project site).

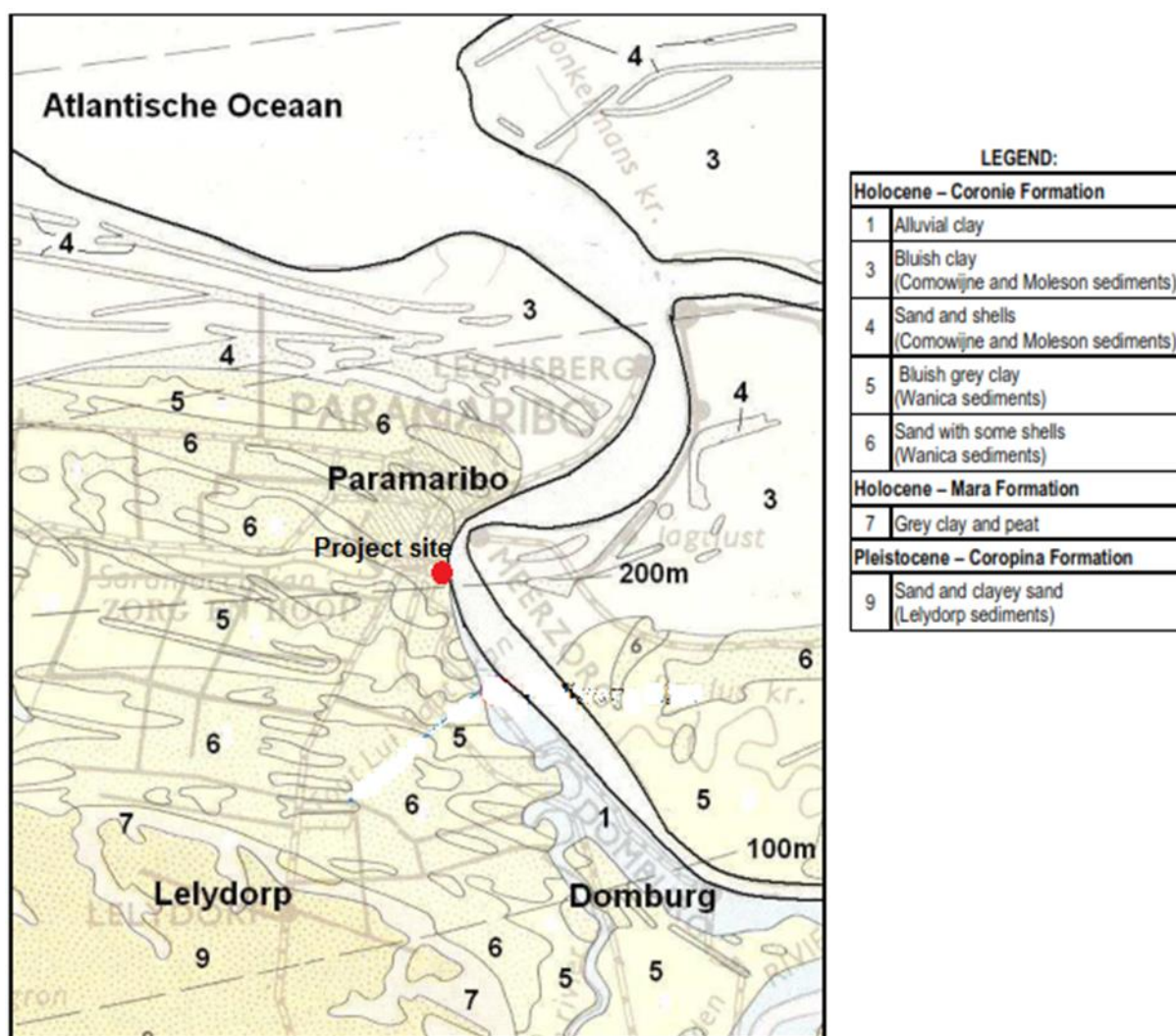


Figure 6 – Geology of the lower Suriname River

(modified from Noordam & Teunissen, 2009)³⁰

³⁰ Noordam & Teunissen (2009). Sediments and Geomorphology Baseline Study for Suriname River Dredging Project, in: SRK (2010). Environmental Impact Assessment for the Staatsolie Refinery Expansion Project Final Environmental Impact Assessment Report Volume 1 (Appendix C)

The geology of the project site is shown in Figure 6. The area is located entirely on the Holocene sediments of the Coronie Formation. The project site itself is located on sand with some shells (map unit 6).

The topography of the larger study area is generally flat, about 3–6m above sea level with minor elevations across the Suriname River and to the south.

5.1.3 Soil

In 2012, SRK³¹ carried out an Environmental Impact Assessment for the pipeline project of Staatsolie, and mentioned that there are no soil information available for the northern section of their study area, which is about the same location of the OTA building project. However, their previous sample drilling showed that the clay soils of the River landscape continue for some 100 to 150 m north of the Saramacca Canal (at the Bruynzeel site). Past this point, the soils have a more sandy character, which continues to the OTA Building project site.

The project site contains several small office buildings that are being used by the Port Management Company. Therefore it is expected that the land has been filled to make it suitable for those buildings. Sand of the nearby ridges is normally used for this purpose.

5.1.4 Noise

Although detailed data are not available, noise levels in the area are likely to comprise an amalgam of noise levels typical of industrial and commercial areas. Main noise sources in the vicinity of the project site are likely to be the Port where 24-hours operations are conducted during 7 days in a week, and the traffic, especially during day times.

The relevant IFC guideline noise levels are indicated in Table 15. This guidelines states that noise impacts should not exceed the levels presented in this table, or result in a maximum increase in background levels of 3 dBA. As the project site can be considered an industrial area, noise levels

³¹ SRK (2012). Environmental Impact Assessment for the Construction and Operation of a Diesel, Gasoline and LPG Pipeline. Final EIA Report

should not exceed 70 dBA at all time, or it should not be more than 3 dBA above the background noise level.

Table 15 – IFC noise levels guidelines

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational ⁵⁵	55	45
Industrial; commercial	70	70

Source: IFC General EHS Guidelines: Environmental Noise Management

5.1.5 Water resources

5.1.5.1 Surface water

The major natural waterway that can be influenced by the OTA building project is the Suriname River. This river is formed by the confluence of the Gran Rio and the Pikin Rio River in the Van Asch Van Wijk range and is joined in the east by the Commewijne River.

Table 16 - River catchments of the study area

River Basin	Catchment Area (km ²)	Mean Discharge at Outfall (m ³ /s)
Suriname	16,500	426

Source: (USACE, 2001)³²

As shown in Table 16, the catchment area of the Suriname River is about 16,500 km, of which 75% is situated upstream of Afobakka. Hydrology in the lower Suriname River is influenced by the Afobakka Dam that was constructed in 1964 in order to generate hydroelectric power for the bauxite and aluminum refinery in Paranam. Water is discharged from the reservoir at a monthly average of 300 m³/sec.³³. Although few data is available, the regulation of flow from the dam reduces high volume discharges and, combined with semi-diurnal tidal influences, affects the

³² USACE (2001) Water Resources Assessment of Suriname. US Army Corps of Engineers

³³ Panday-Verheuvél, M. P. (1982) Factors Influencing Water Quality and Life in the Suriname River. Hydraulic Research Division. Paramaribo.

hydrology of the lower Suriname River (consequently also the occurrence of flooding in some areas of the lower estuary). The tidal effect, especially during the long dry season, can reach 164 km upstream.

Water from the dam also has a decreased dissolved oxygen content which is a problem for aquatic ecosystems close to Afobakka dam, however, this is less of an issue towards the estuary where mixing with oxygen-rich sea water occurs.³⁴

The Suriname River is approximately 480 km long that flows in a generally south to north direction and drains approximately 10% of Suriname. Peak flows generally occur during the long wet season from April to August and low flow periods generally occur during the long dry season from August to December³⁵. At the mouth of the river, the mean flow rate is 426 m³/s (Table 16), and there is an additional tidal movement of up to an additional 3000 m³/sec³⁶.

The project site is located approximately 30 km upstream of the river mouth on the river's western bank, just downstream of the Jules Wijdenbosch Bridge. The river width in this section is about 920 m at the bridge. The river's mean discharge at its mouth was estimated at 440 m³/s in 1993, with a range between 220 m³/s and 1 800 m³/s in the dry and wet season, respectively³⁷.

5.1.5.2 Suriname River Water Quality

Water in the Suriname River is fresh from the headwaters in the south to roughly the northern quarter of the country, where the river becomes an estuary and saline ocean water mixing occurs.

Data reviewed from the Hydrological Annual reports (1983 – 1985) by SRK³⁸ shows that water quality at Nieuw Amsterdam, Belwaarde, Jagtlust, Domburg and Paranam have a circum-neutral pH (between 6.5 – 7.6) with pH slightly decreasing further upstream. Salinity decreases upstream, from 28‰ near the mouth of the river to <0.1‰ near Domburg. The waters are well oxygenated. Ammonia levels around Domburg are higher than along other points of the Suriname River, possibly due to the presence of discharges from agricultural activities in the area. No metal

³⁴ Panday-Verheuvell, M. P. (1982) Factors Influencing Water Quality and Life in the Suriname River. Hydraulic Research Division. Paramaribo

³⁵ USACE (2001) Water Resources Assessment of Suriname. US Army Corps of Engineers

³⁶ Hydraulic Research Division (1982) Factors Influencing Water Quality and Life in the Suriname River.

³⁷ Moekiran A. Amatali (1993) Fresh Water Ecosystems of Suriname, "Climate and Surface Water Hydrology," Paul E. Ouboter, editor, Dordrecht, Netherlands: Kluwer Academic Publishers, 1993, pp. 29-51.

³⁸ SRK (2007). Water Resources Baseline Study for Suriname River Dredging Project. SRK Consulting (UK) Ltd

concentrations were recorded. No water quality data exists for the Paramaribo area.

Some water sampling and analysis was undertaken by Ouboter & Bakkum in 2000³⁹ around Leonsberg (just to the north-east of Paramaribo), Domburg (at km 70) and in primary drainage canals in Paramaribo. River water around Leonsberg had circum-neutral pH (6.8 – 7.5), high conductivity (14,570 – 39,100 $\mu\text{S}/\text{cm}$), and elevated total suspended solids (TSS) concentrations (238 – 1045 mg/L).

While the rivers in Suriname's Interior are usually oligotrophic (nutrient poor) with low amounts of dissolved and suspended solids, the intrusion of seawater into the lower reaches of rivers introduces higher salinity and loads of suspended solids from the river estuaries.

During the rainy seasons, when the freshwater discharge is highest, the seawater intrusion is lowest, while seawater intrudes further up the river during the dry seasons. Salt water in the Suriname River intrudes up to Domburg during the dry season, while intrusion during the rainy season does not go beyond the Saramacca Canal.

Consortium (2001)⁴⁰ and Rex (2009) ascertained bacterial contamination of the Suriname River through high concentrations of total coliforms. This may pose a threat to health from exposure when swimming or during flood events.

Water quality data collected and analysed by Consortium⁴¹ in 1999 and 2000 indicate that:

- Oxygen levels are low to very low in most primary and secondary canals in Greater Paramaribo;
- All sampled drainage canals in Greater Paramaribo have high to very high concentrations of coliforms, indicating bacterial contamination, most likely from septic systems. Coliform concentrations decrease further away from the source due to dilution and bacterial breakdown. The same trend is observed for organic matter, Biological Oxygen Demand, Chemical Oxygen Demand, total nitrogen, ammonium and chlorophyll-a;
- The level of coliforms may pose a threat to health when water contact occurs during swimming or flooding; and
- Concentrations of heavy metals, particularly mercury, lead, cadmium and zinc, are

³⁹ Ouboter, P.E. & R. Bakkum (2000). Masterplanstudie Ontwatering Groot-Paramaribo. Aspect rapportage Waterkwaliteit. Ingenieursbureaucombinatie DHV-WL-AMI-SUNECON, Paramaribo, 56 pp.

⁴⁰ Consortium, (2001). Aspect rapportage waterkwaliteit. Masterplanstudie ontwatering GrootParamaribo. Ingenieursbureaucombinatie DHV-WL-AMI-SUNECON. 7 april 2001.

⁴¹ Consortium, (2001). Aspect rapportage waterkwaliteit. Masterplanstudie ontwatering GrootParamaribo. Ingenieursbureaucombinatie DHV-WL-AMI-SUNECON. 7 april 2001

relatively high at many locations in the Paramaribo drainage system. These are thought to be caused by industry, waste dumping, discarded batteries and car wrecks.

5.1.5.3 Groundwater

The study area is underlain by three major aquifers within the Corantijn Group (see Figure 7):

- The A-sand aquifer (in the Burnside Formation) contains freshwater in many locations, including Paramaribo and the project site. It is found here at approximate depths between 120 and 160 m. The aquifer thickness varies from 10-60 m. The A-Sand aquifer is not directly recharged by rainwater, and it is suspected that upward leakage of groundwater from the older, underlying formation is likely;
- The Coesewijne aquifer contains freshwater in many locations of the coastal plain, including Paramaribo and the project site. The top of the aquifer is found at a depth of 70 m at Paramaribo and slightly less deep in the pipeline area. The Coesewijne sands are in hydraulic contact with the overlying Zanderij Formation, with groundwater flow in the southern Young Coastal Plain (Helena Christina road – Lelydorp) and diffusion in the northern Young Coastal Plain; and
- The Zanderij aquifer contains mostly brackish water in the Young Coastal Plain, including the project site. The Formation crops out in the Savanna Belt and dips to the north. At Paramaribo it is found at depths of about 30-50 m. The Zanderij Formation is in hydraulic contact with the sandy deposits of the Coropina Formation (Lelydorp Deposits) south of Lelydorp. To the north and in the study area, the aquifer does not have hydraulic contact with surface deposits due to the heavy clay in overlying layers.

Groundwater is abstracted from the Zanderij aquifer south of Paramaribo (e.g. at Lelydorp) and the Coesewijne and A-Sand aquifers in Paramaribo itself. Nearby the project site (about 1.2 km northwest), groundwater is withdrawn from the A-sand aquifer at William Kraanplein (“Poelepantje”).

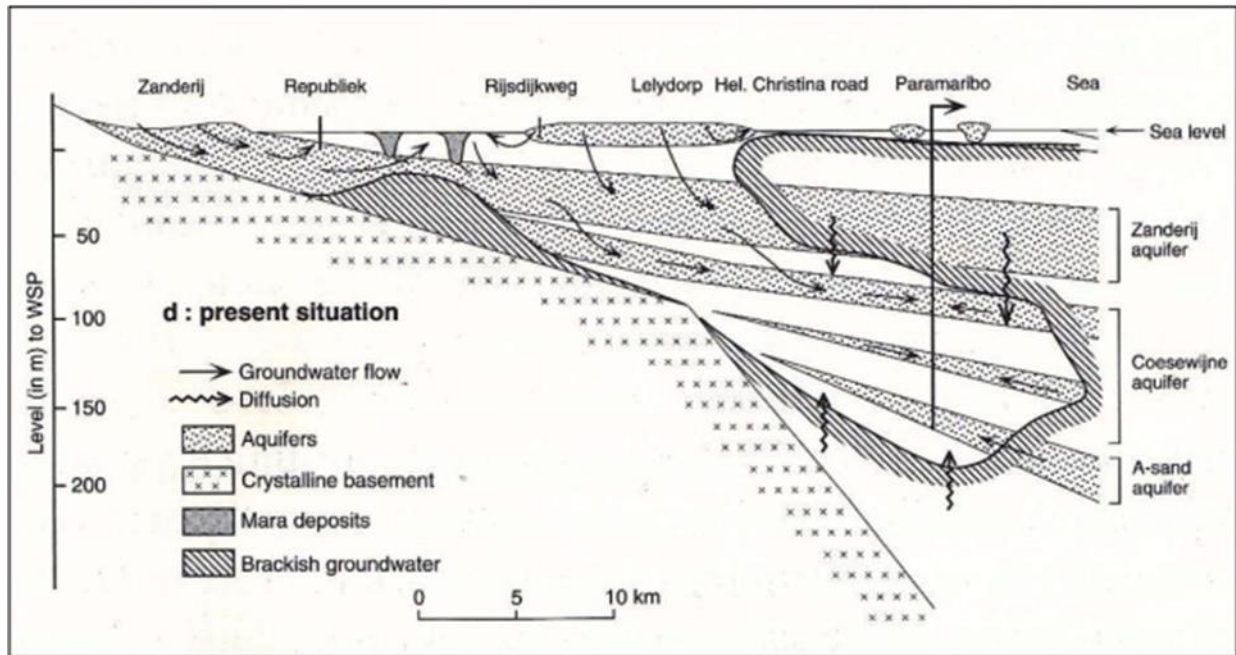


Figure 7 - Hydrogeological section Zanderij-Paramaribo

Source: Groen (1998)⁴²

5.1.6 Terrestrial ecology

The original vegetation of the study area was cleared many years ago when subsequent developments took place in the area. A small part of the study area is now covered with mainly low grass growth whilst the larger part is used for office and port facilities.

Observations done in the project site shows that all plants were very common species for these vegetation types, and no vulnerable, rare or endangered plant species were recorded. As such, no sensitive ecological areas are expected to occur in the study area.

The natural wildlife of the study area has disappeared due to the loss of habitat. Only species that are commonly associated with human presence have been observed were birds and reptiles:

⁴² Groen, J. (1998). Hydrogeological investigations in Suriname. - p. 129-174. In: Th. E. Wong, D.R. De Vletter, L. Krook, J.I.S. Zonneveld, and A.J. Van Loon, (eds). The history of earth sciences in Suriname - Kon. Ned. Akad. Wet. And Ned. Inst. Toegep. Geowet. TNO.

5.1.7 Aquatic ecology

The lower Suriname River is a moderately to highly disturbed ecosystem that has been adversely affected by anthropogenic activities.

Fish sampling conducted by Mol (2007)⁴³ found 25 species of fish in the upper estuary of the river (in the vicinity of Paramaribo), probably as result of the varying water conditions created by the convergence of the estuarine and freshwater reaches of the river.

No fish species endemic to the Suriname River or to Suriname were recorded during this study⁴⁴. The Coastal Dolphin (*Sotalia guianensis*) is commonly observed in the Suriname River estuary.

Other aquatic or semi-aquatic species that may occur in the Suriname River include amphibians (frogs and toads) and reptiles such as caimans and turtles.

No sensitive habitats have been identified in the Suriname River near the study area.

⁴³ Mol, J. (2007). Baseline Study of Aquatic Ecosystems and Fisheries of the Lower Suriname River. AdeKUvS/Celos

⁴⁴ Ibid.

5.2 Social Baseline and Impact Assessment

The following sections aim to describe and characterize the social and socio-economic environment of the area surrounding the location of the proposed project.

5.2.1 History and Archaeology

Suriname was first discovered by Spanish seafarers in 1499. Since then, Europeans have settled in the Surinamese coastal area to seek gold and later to cultivate coffee, cotton, cocoa and sugar on plantations. In 1667, the Dutch gained control over Suriname. Africans, mostly from West Africa, were shipped to Suriname and sold on the slave market. Many were set to work on the plantations, of which there were more than 500 in 1750. In 1791, 53,000 Africans were enslaved in Suriname⁴⁵.

Ressort Beekhuizen has a rich history. In 1700, it was a sugar-producing plantation named Plantation ‘Beekhuysen’, or in Surinamese language named “Be’koisi” (Figure 8). After the abolition of slavery in 1863, the area had further developed into a busy commercial and industrial area mixed with some residential areas. No archaeological or sacred sites are in ressort Beekhuizen.

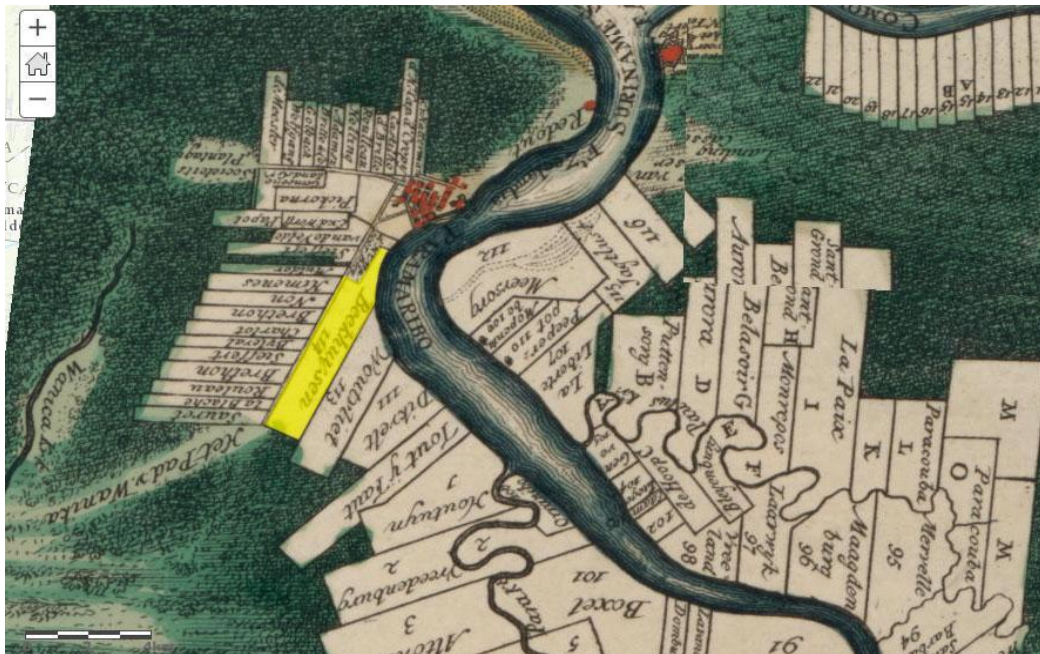


Figure 8 - Plantation Map of Suriname with plantation ‘Beekhuysen’. Source: ARCGIS Plantation Map of Suriname

⁴⁵ <https://www.rijksmuseum.nl/nl/rijksstudio/tijdlijn-nederlandse-geschiedenis/1700-1830-suriname>

5.2.2 Administrative Structure

The study area is in the city of Paramaribo, where approximately half of Suriname's population lives. Historically, Paramaribo has been known for housing a centralized government structure where administration is regulated for the whole country. Efforts for decentralization of administrative government are progressing slowly since 2002. The other two bodies of the *trias politica* – executive and legislative branch – are also located in Paramaribo.

The name Paramaribo is used to designate the capital city of Suriname as well as the district of Paramaribo. Like the other nine⁴⁶ districts, Paramaribo consist of a representative and executive branch. The representative branch is formed by the district councils and members are chosen together with the members of parliament in national elections every five years. The executive branch oversees: i) maintenance of secondary and tertiary infrastructure (roads, drainage, irrigation), public parks and open spaces; ii) management of public markets; iii) solid waste collection and disposal; iv) provision of trucked-in potable water; v) fire prevention and control; vi) local planning and budgeting; vii) maintenance of public order; and viii) supervision of public health (including cemeteries).

Both the executive and representative branch are chaired by the district commissioner, who is appointed (and dismissed) by the President of Suriname. The district commissioner usually has several assistants: i) superintendents, responsible for overlooking the needs of jurisdictions; ii) a clerk's office, dealing with archives, bookkeeping and secretarial support; and iii) a technical area comprising infrastructure maintenance. Most district offices are over-staffed with low skilled and underpaid workers.

The district of Paramaribo is further administratively subdivided into 12 ressorts⁴⁷ (Figure 10). Seven ressorts reside under the jurisdiction of District Commissioner of South-West and the remaining five ressorts – Rainville, Centrum, Blauwgrond, Munder and Beekhuizen – are managed by the North-East District Commissioner. The study area is in ressort Beekhuizen, a 6 km² large area that includes the main seaport. Each ressort elects several representatives into a representative body called ressort council. In Beekhuizen, one ressort representative currently is actively working for the neighborhood, especially in promoting sports for youth.

According to Article 161 of the 1987 Constitution are these ressort councils the highest political-

⁴⁶ Marowijne, Commewijne, Para, Wanica, Coronie, Saramacca, Nickerie, Brokopondo and Sipaliwini

⁴⁷ Flora, Livorno, Tammenga. Pontbuiten, Welgelegen, Latour, Weg naar Zee, Rainville, Centrum, Blauwgrond, Munder and Beekhuizen

administrative body in the district. However, until now, the ressort councils have not functioned effectively due to small populations and restricted jurisdiction of ressort councils (on economic drivers). Although ressorts are the lowest administrative organ of government, in general, they have limited executive power. Their main task is to channel information and signal the higher level of government, such as the district commissioner, members of parliament and high-level staff of Ministries⁴⁸.

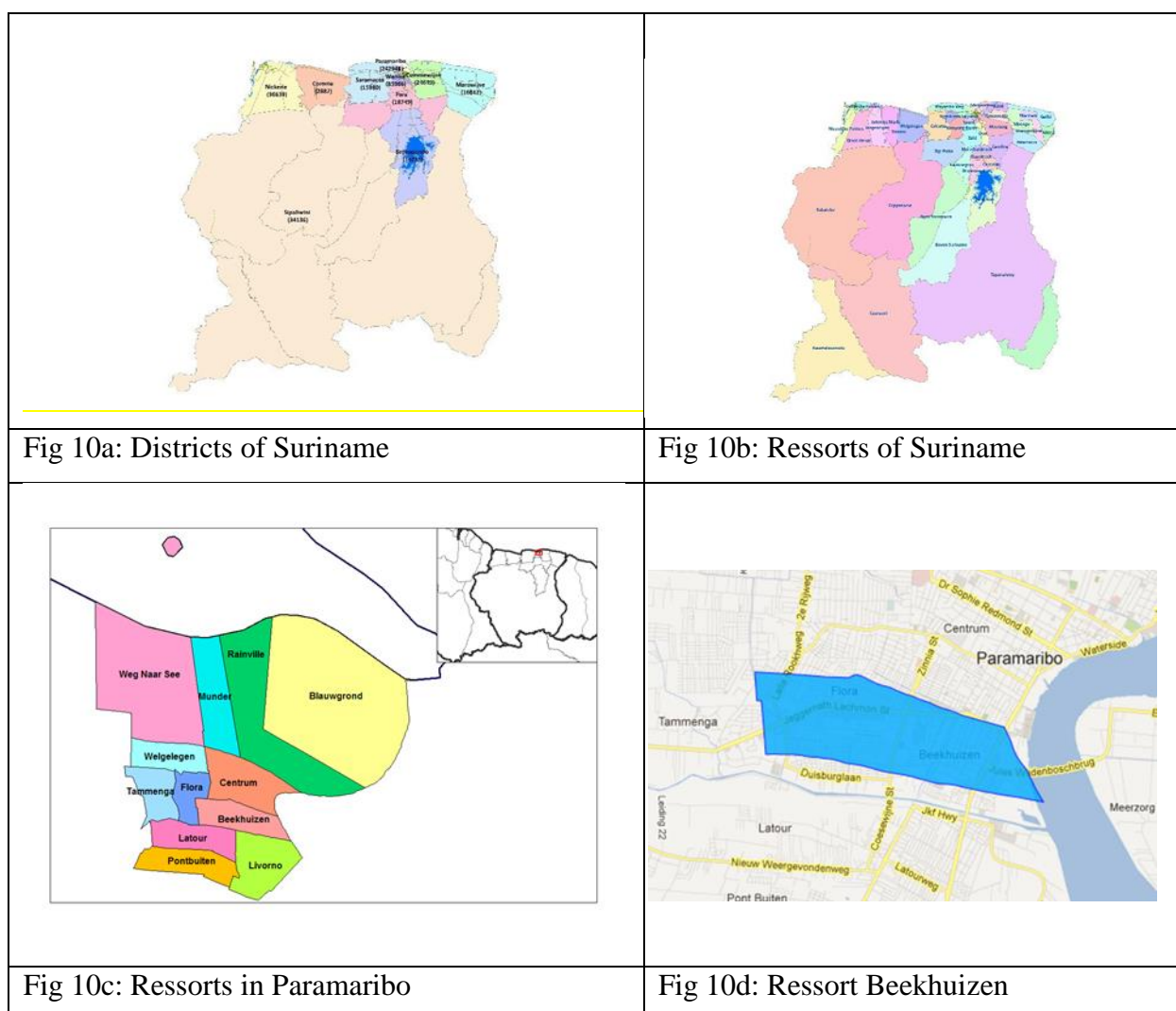


Figure 9 – Overview of districts and ressorts

⁴⁸Amatali, B. Guidelines decentralization. IADB Decentralization and Local Government Strengthening Program

5.2.3 Population and Demographics

a. Population

According to the last census⁴⁹, Suriname has a total population of 541,638, of which 49.6% are male and 50.4% are female. Approximately half of the people live in the 182 km² wide urban district of Paramaribo.

Ressort Beekhuizen registered 17,185 people with a similar division of men and women as Paramaribo (Figure 10). The number of elderly (60 years and older) is relatively small compared to the overall population of Paramaribo (Figure 10). Beekhuizen is a relatively crowded ressort. Its population density of 2864 inhabitants per km² is 2.2 times higher than the average density of District Paramaribo.

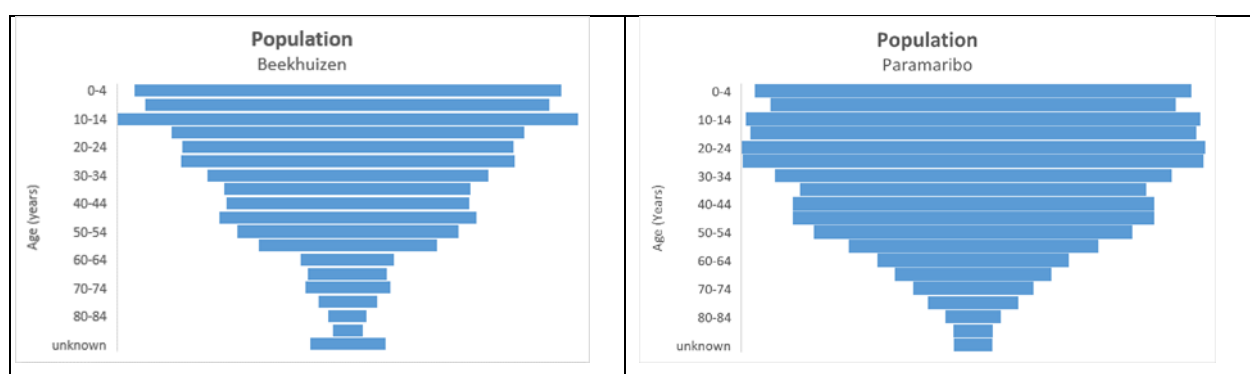


Figure 10 - Population of Ressort Beekhuizen and Paramaribo. Source: ABS 2014

b. Population Growth

In ressort Beekhuizen, the population decreased by 13% between 2004 - 2012. Lower population numbers are seen across all age groups: a decrease of 8% for the age group 0-14 years, 24% for the age group 15-59 years and 31% for peoples of 60 years and older. The growth pattern of Beekhuizen is very different from the overall pattern in Paramaribo: there is negative instead of positive growth. Only 4⁵⁰ out of all 12 ressorts in Paramaribo showed a negative population growth

⁴⁹Algemeen Bureau voor de Statistiek. 2014. Districts Resultaten Volume I Paramaribo, Wanica 8e Volks- en Woningtelling Suriname

⁵⁰ Ressort Rainville -21.2%, Welgelegen -18.6%, Centrum -29.5%, Beekhuizen -13.1%

between 2004 - 2012.

c. Migration

Traditionally, the population in Suriname has been living in three main areas:

- Urban areas with 67 % of the population (Paramaribo and Wanica)
- Rural areas with 20% of the population (Commewijne, Para, Saramacca, Coronie and Nickerie)
- Interior with 13% of the population (Brokopondo, Marowijne and Sipaliwini).

The inland migration pattern between 2004 - 2012 is characterized by the following:

- The urban population stayed in the urban areas. Paramaribo has been growing steadily. In 2011, 23% (41,063) more peoples lived in Paramaribo compared to 2004. Ressort Beekhuizen follows this pattern.
- The rural and interior inhabitants, 10 % of the total population, moved to district Paramaribo and Wanica. Persons that moved were particularly between 15-29 years and seeking jobs and education opportunities⁵¹.
- Inland migration shows a decreasing trend: approximately one third of peoples have moved in 2011 (3,250) compared to 2004 (11,848).

Although this data gives a general impression about inter-district migration, it should be taken with caution. Generally, peoples have limited incentive to register an inter-district move at the Government's office. The place of domicile is only significant during the general elections that are held every five years.

d. Households

The average household size in Paramaribo is 4.0. Beekhuizen, with an average of 3.9 persons per household, has slightly smaller households than the average in Paramaribo. Of these households, approximately 39% are headed by women. This is four times higher than the average of 9.6% calculated for Paramaribo (2012), and common for households from relatively poor neighborhoods. The two residential areas in the study area, Abra Broki and Beekhuizen are

⁵¹ Menke, J (Ed). 2016. Mozaïek van het Surinaamse Volk. Volkstellingen in Demografisch, Sociaal en Economisch Perspectief

commonly considered belonging to the poorer areas of Paramaribo⁵².

e. Ethnicity, Religion and Language

Creoles are the largest group present in Ressort Beekhuizen (37%), followed by the descendants from India (21%), a population with mixed ethnicity (18%) and the maroons, descended from African slaves (14%). Smaller groups of peoples are formed by the indigenous peoples, Indonesia-descendants, Chinese, Caucasians and others. The distribution of ethnicity pattern coincides with that of District Paramaribo.

The diversity of Suriname's population is reflected into people's religious beliefs: traditionally Indians practice Hinduism, Asia-descendants are Muslim and creoles are Christians. For Paramaribo, most people are Christians: Roman Catholic religion is the largest group, followed by the Moravian Church and the evangelists. Other faiths of importance are Hinduism and Islam. Smaller groups practice Judaism, Javanism (from Indonesia) and the Winti religion (from Africa). In ressort Beekhuizen, peoples speak mostly Dutch, followed by Sranan tongo (Surinamese lingua franca) and Aucaans (maroon language).

5.2.4 Employment and Occupation

a. Employment

Paramaribo is known as the economic center because it provides businesses support in banking, insurance and Government services. Beekhuizen, closely located to downtown Paramaribo, has an economically active population of approximately 6,878 peoples⁵³. Many of these peoples have unskilled occupations and rely on the informal sector.

Numbers show that the unemployment rate among the economically active population (the total non-institutional population between the ages of 15 and 64) living in ressort Beekhuizen, is higher

⁵²http://www.academia.edu/11586884/Levende-doden_Afrikaans-Surinaamse_percepties_praktijken_en_rituelen_random_dood_en_rouw

⁵³ SRK Consulting. 2012. Environmental Impact Assessment for the Construction and Operation of a Diesel, Gasoline and LPG Pipeline Final EIA Report

compared to the city average of Paramaribo (Figure 16). The relatively high unemployment rate lies in steep contrast with the high number of commercial activities and registered companies in the area. According to the Chamber of Commerce, as of 2017, more than 930 registered companies are established in ressort Beekhuizen⁵⁴. However, it must be noted that a quarter of these companies are no longer operational.

b. Occupation

When looking at the occupational groups of the economically active population in Beekhuizen, some interesting facts come to the forefront. Numbers show that a large part of population in Beekhuizen have elementary occupations (20,4%) or are service/shop/market sales workers (17%). Beekhuizen does not deviate much from the city average for almost all occupations, except for elementary occupations in which the percentage is higher than the city average (Table 17 and Figure 11).

Table 17 - Economic Active Population Ressort Beekhuizen and Paramaribo. Source: ABS statistics 2004

Economic Active Population (15-64)	Beekhuizen	Paramaribo average
Total Non-Institutional population aged 15-64	11712	13029
Economically Active population (Strict ILO definition)	6878	7666
Economically Active population (Relaxed ILO definition)	7152	7893
Employed	6128	7011
Unemployed	750	656
Not-economically Active, discouraged	274	227
unemployment rate % Strict	11	9
unemployment rate % Relaxed	14	12

⁵⁴ Suriname Chamber of Commerce (KKF), 2017

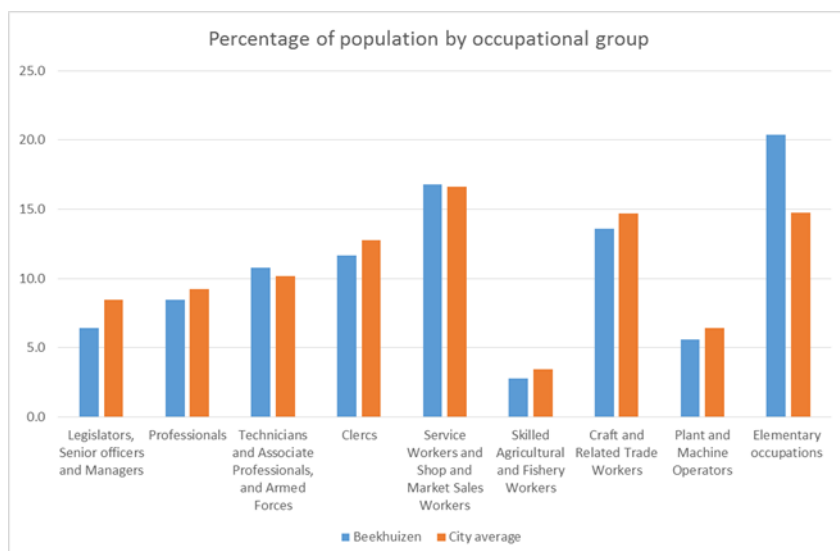


Figure 11 - Population by occupational group. Source: ABS Statistics 2004

c. Income

For Paramaribo, data suggests that the gross national income per capita lies between \$8,000 and \$8,500⁵⁵. Data on income for Ressort Beekhuizen are unavailable.

5.2.5 Education

a. Educational System

The education system in Suriname is divided in three segments⁵⁶:

- *1.Primary education:*
 - pre-primary education “kleuteronderwijs” (K.O. schools): children ages 4-6
 - primary schools “Gewoon Lager Onderwijs”(G.L.O. schools): children ages 6-12
- *2.Secondary education:*
 - Junior secondary education “Voortgezet Onderwijs voor Junior” (VOJ schools)
 - Secondary general education “Meer Uitgebreid Lager Onderwijs

⁵⁵ United Nation Development programme, 2013. Human Development Atlas Suriname

⁵⁶ Menke, J (Ed). 2016. Mozaïek van het Surinaamse Volk. Volkstellingen in Demografisch, Sociaal en Economisch Perspectief

- (M.U.L.O. schools) 4 years duration
- Secondary vocational education “Lager Beroepsonderwijs” (LBO schools) 1-4 years’ duration
- Senior secondary education “Voortgezet Onderwijs voor Senior” (VOS schools)
 - Pre-university education “Voorbereidend Wetenschappelijk Onderwijs” (VWO schools) 3 years’ duration
 - Continued secondary education “Hoger Algemeen Voortgezet Onderwijs” (HAVO schools) 2 years’ duration
 - Higher vocational education (Institute for secondary economic and administrative education “IMEAO”, Middleware Handelsavondschool (MHAS) & Technical education Natuurtechnisch Instituut (NATIN) and pedagogical institutes (1-4 years)
- *3. Tertiary education:*
 - Anton de Kom University of Suriname (ADEK)
 - Higher vocational education (HBO schools)
 - Institute for teacher training “Instituut voor de Opleiding van Leraren” (IOL schools)

Compulsory education in Suriname runs from age 7 to 12. On national level children stay in school for 7.2 years on average. From the age of 4, 91% are enrolled in primary education, however only approximately half of this age group will continue to secondary school.

The literacy rate of adults (15 years and older) is 95%, which is equal among men and women 96 respectively 95%. (Figure 12). For youth between 15 and 24 years, the literacy rate is 98% which is also equal among men and women – 98/99%⁵⁷. No data on literacy rates among men and women on the level of ressort Beekhuizen is available.

⁵⁷ Papadongonas, P (2013) Tracing Surinamese Identity in Paramaribo. Bachelor Thesis Human Geography and Urban Planning. College of Social Sciences. University of Amsterdam, Netherlands.

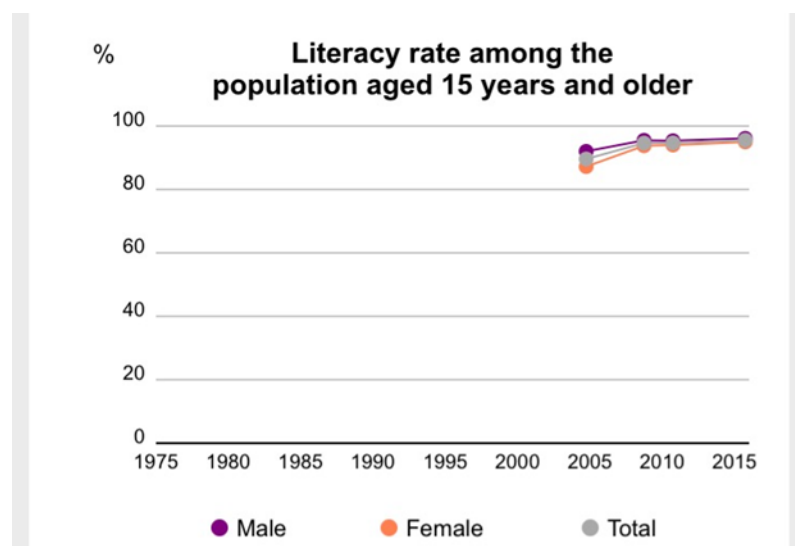


Figure 12 - Literacy rate in Suriname. Source: UNESCO Institute for Statistics

b. Educational Levels

Figure 13 shows the proportion of the population within the ressort of Paramaribo that have completed at least junior secondary education (VOJ), a primary education (GLO) or lower⁵⁸. This shows that the educational level of the population in Beekhuizen is slightly higher in comparison to the citywide average of Paramaribo in 2004. However, six years later, the proportion of the population in Beekhuizen that has completed secondary education and higher is significantly lower than the city average (Table 18).

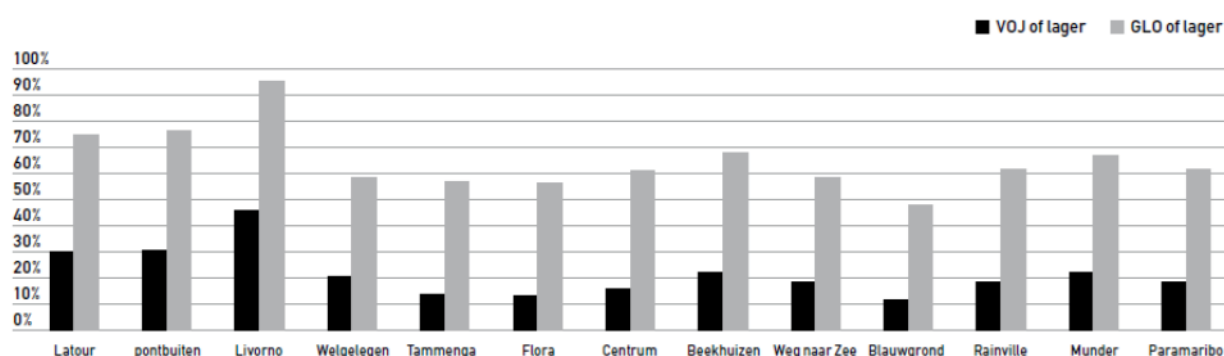


Figure 13 - Completed educational levels within the ressort of Paramaribo. Source: ABS Statistics 2004

⁵⁸Verrest H. (2010) Paramaribo: Caribische stad zonder scheidslijnen. Rooilijn, jg.43 No.3 2010 pg.163

Table 18 - Educational level of population in Ressorts of Paramaribo (2010)

Persons 15+ of the non-institutional population by highest education level	Beekhuizen	Paramaribo average
Total	17568	18305
None/Kindergarten	1365	1274
Primary	4829	5152
Lower Vocational & Other Junior Secondary education	6462	6381
Senior Secondary General + Senior Secondary Vocational and Technical Education+ Teachers Training College	2130	2781
Higher Vocational education + University	782	1111
Other	166	133
Unknown	1834	1474

c. Schools in Beekhuizen

Ressort Beekhuizen has a relatively high number of educational facilities in its range. The area houses 27 educational facilities, mostly primary and secondary schools (Figure 14). Beekhuizen houses one kindergarten-level school, 13 primary schools and 13 secondary schools. The only two educational facilities in Suriname that provide a teacher's degree are among these secondary schools in Beekhuizen.

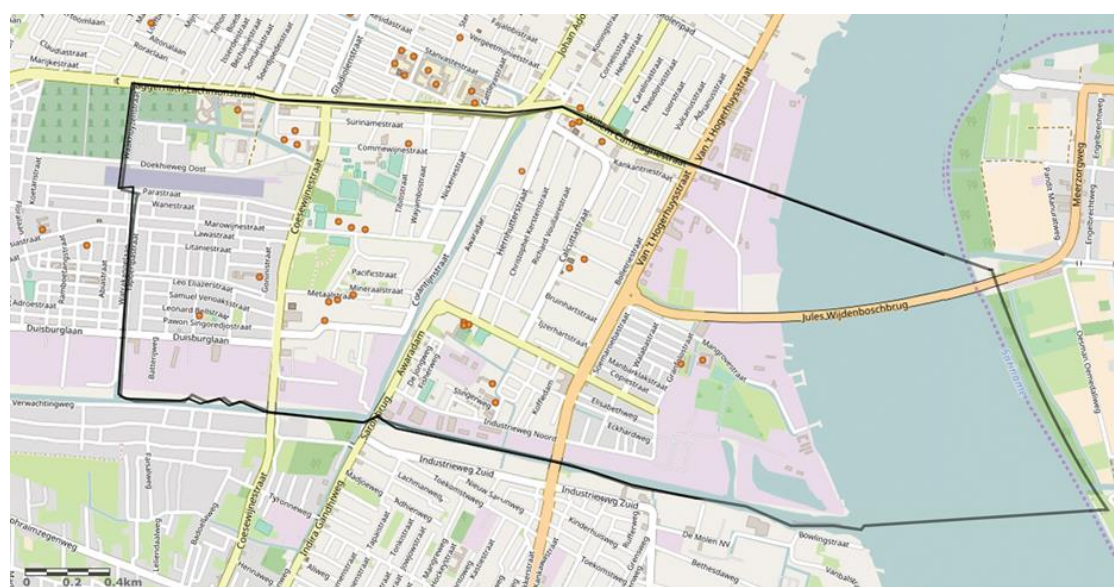


Figure 14 - Schools in ressort Beekhuizen

5.2.6 Health and Wellbeing

a. Healthcare facilities

Within ressort Beekhuizen there is a privately-owned pharmacy and medical clinic (operated from a residence) open to the general public. The Government has no health care facility near the study area or in ressort Beekhuizen. Suralco, a subsidiary of mining company Alcoa, has a clinic at the Van 't Hogerhuysstraat for active and retired personnel.

The closest hospital, called Diakonessenhuis, is approximately 2.4 km from the construction site. This facility offers several services to the public: radiology services, laboratory, pharmacy and cancer treatment center. In and around this hospital, general physicians and medical specialists (surgery, gynecology, gastroenteritis, plastic surgery, orthopedics, neurology, internal medicine, pediatrics, urology, psychiatrics, ear, nose, and throat) have clinics.

Emergency services are provided by Academic Hospital, approximately 3.7 km away from the proposed construction site. A smaller emergency post has been recently opened (Latour) and this post is located approximately 2.8 km from the site. An overview of healthcare facilities is shown in Figure 15.

Residents of Beekhuizen and Abra Broki seek medical services around the nearby hospital (Diakonessenhuis) or in downtown Paramaribo. Very few people visit other healthcare facilities in ressort Beekhuizen.



Figure 15 - Healthcare facilities in the area

b. Mortality and Disease

In 2015, 4304 persons were born and 1804 died in Paramaribo. Death is predominantly caused by non-communicable diseases, such as cardiovascular diseases, followed by cancers, diabetes and chronic respiratory disease. The life expectancy in Suriname is 71.15, with a slightly higher number for women (74.43) than for men (68.02) (2014).

Abra Broki is known for recurrent communicable disease (e.g. Chikungunya) outbreaks because of clogged waterways since 2000⁵⁹⁶⁰.

⁵⁹ <http://www.srnieuws.com/404.php>

⁶⁰ <http://www.niuws-suriname.nl/wateroverlast-abra-broki-terugkerend-probleem/e>

5.2.7 Infrastructure and Transportation

a. Water and Sanitation

Suriname has enormous water reserves. Depending on the area, fresh water and groundwater resources are exceptionally plentiful. Suriname's water is clean and safe to drink from the tap. In ressort Beekhuizen, water is provided by the state-owned water company (SWM). In Paramaribo, approximately 93% of all households have access to a tap water connection, compared to 67% of the coastal area and 20% of the interior. 96% of houses in Ressort Beekhuizen have access to piped water⁶¹. Approximately 90% of Paramaribo households has flushed sanitation systems into septic tanks (human dev atlas).

b. Electricity

Energy consumption increased by approximately 7.4% annually over the last 5 years. A shortage of energy hampers the expansion of the industrial sector in Suriname. However, prospects are positive since Suriname has all the natural resources to generate power. The state-owned company N.V. Energiebedrijven Suriname (EBS) is the main energy provider in Suriname. The energy offered by EBS comes mainly from a hydroelectric power plant located 100-km from Paramaribo. The plant generates around 80 megawatts (MW, or million watt), but has a maximum capacity of 189 MW. The Brokopondo reservoir is part of the so-called "EPAR" (Electricity Paramaribo) electricity grid which covers the greater Paramaribo area, including ressort Beekhuizen⁶²

c. Roads

The proposed buildings will be located along the Van't Hogerhuysstraat, a one-way, north-south, primary road which is used for three purposes: residential, business and industrial use.

- Residential use: The Van 't Hogerhuysstraat connects downtown Paramaribo with Southern-located residential areas. Peoples living in the rural and interior lands prefer using the Van 't

⁶¹ABS Statistics 2004

⁶²http://www.gov.sr/media/288454/investerings_gids_suriname_aug2010.pdf

Hogerhuysstraat to visit and shop in downtown (usually in the area around the central Market).

- Business use: Along the Van ‘t Hogerhuysstraat are several important government offices and business located that are open to the public during business hours.
- Industrial use: The Van ‘t Hogerhuysstraat serves as a main route for industrial traffic going to and coming from the i) port and ii) industrial area with factories and processing plants, located South to the Van ‘t Hogerhuysstraat – approximately 1.2 km distance from the OTA building site.

The Van ‘t Hogerhuysstraat connects with a 1505 meter-long Wijdenbosch bridge, that is the only connection between Paramaribo and the eastern-located districts of Commewijne and Marowijne, and on a larger scale, connecting the countries in the Guyana Shield with the IIRSA⁶³ road network in South America. The bridge is connected through a rotunda with the road network.

d. Transportation

The main hub for public road transportation is in downtown Paramaribo. From here, busses go to the different places in the country. Buses frequently stop at bus stops along the Van ‘t Hogerhuysstraat for exit and entrance of passengers.

Thirty-two bus routes pass the Van ‘t Hogerhuysstraat (Table 19), and these are:

- Within Paramaribo (6%)
- The outskirts of Paramaribo (31%)
- Other districts (63%)

Table 19 - Bus routes passing the Study Site. Source: Nationaal Vervoersbedrijf

Route	Direction	Name Busline
Within Paramaribo		
From downtown	South-West	Goede Verwachting, La Vigilantia
Paramaribo to Outskirts/Rural Areas		
Wanica	South-West	Boma-PSP, Boma-Zand, Welgedacht B, Welgedacht C, Helena Christina, Domburg, Houttuin, Malan, Livorno,

⁶³ Initiative for the Integration of the Regional Infrastructure of South America

		Santigron
Paramaribo to other Districts		
Para	South	Berlijn, Billiton, Bersaba, Cassipora, Bigi Poika, Matta, Misman project, Pikin Saron, Rijsdijk, Onverwacht, Zanderij
Brokopondo	South	Afobaka, Atjoni, Brokopondo, Brownsweg, Klaaskreek, Nieuw Koffiekamp
Marowijne	East	Albina, Moengo
Commewijne	East	Meerzorg

The Van 't Hogerhuysstraat is also utilized as a pick-up point for mining and other companies with production plants outside Paramaribo e.g. Rosebel Gold Mines, Newmont. Moreover, individuals prefer meeting at the Gow2 station when going towards recreational places located in the districts of Commewijne, Para or further South.

e. Traffic Flow and Traffic Safety

Traffic Flow

Industrial Area: Nieuwe Haven

The roads near the study site are privately owned by the Port Authority. The Port Authority sets the rules for (container) trucks using these roads. One road, in north-south direction, grants access to the public; this road connects to private and Government offices, pharmacy, as well as port services.

Daily, approximately 200 container trucks use the Abattoirweg. In addition, 30-45 oil trucks travel on the Abattoirweg from the depot (SOL) to gas suppliers in Paramaribo. Large trucks have problems exiting the depot entrance, due to the narrow (6 meter) road dimension. Also, container trucks also use the Abattoirweg for exiting the port to the main road.

The Abattoirweg is closed during the night for security reasons.

Main Road: Van 't Hogerhuysstraat

The study site is in one of the highest traffic areas of Paramaribo and research indicated that

40,000⁶⁴ vehicles pass every day. Road users encounter many traffic rules at the main road that require slowing down or stopping e.g. crossings, bus stops, junctions, and a roundabout. Daily, approximately 35 oil trucks (Gow2) also enter the Van 't Hogerhuysstraat to supply gas stations. Heavy traffic coming from the port (200 container trucks) faces several problems when entering or exiting the Van 't Hogerhuysstraat from the Abattoirweg: i) they can't cross the road when going to north or west, and need to turn around using the roundabout, ii) when making the turn into the Abattoirweg, they need to consider slower traffic.

During peak hours, 6-8:30 AM, 12-14 PM and 15-16.30 PM, the Van 't Hogerhuysstraat is saturated and gridlocked with trucks, buses, cars, mopeds and pedestrians. This one-way street is characterized by several important road junctions.

- The T-junction with Havenlaan-Noord is unregulated but traffic can only be guided one way (Point A in Figure 16).
- The four-way intersection with Havenlaan-Zuid/Willem Campagneweg is regulated by a traffic light (Point B in Figure 16).
- The T-junction with Kankantriestraat is unregulated but traffic can only be guided one-way (Point C in Figure 16)
- The T-junction with Abattoirweg is unregulated but traffic can only be guided one-way (Point D in Figure 16)
- The four-way intersection with Slangenhoutstraat is unregulated (Point E in Figure 16)
- The four-way intersection with Industrieweg-Noord is unregulated. (Point F in Figure 16).
- The roundabout, guiding all traffic coming from and going to District Commewijne.

Residents of Abra Broki can access the Van't Hogerhuysstraat (main road) through point B, C, D, E and F. Only point B is regulated by a traffic light and police regulation to guide traffic is necessary during morning peak hours. Traffic accessing the main road through point C, D, E and F is problematic. The last two intersections are always busy and chaotic. Residents of Beekhuizen only have one access point to the main road - intersection E.

⁶⁴ Personal Communication with Mr. Wip from the Traffic Department of the Ministry of Public Works, Communication and Transport, dd. 9 March 2017



Figure 16 - Traffic situation at the study site

Traffic Safety

Traffic safety has been a major concern in Suriname. The annual amount of traffic victims recorded has been on the high-end of the world average of 21 fatalities per 100.000 inhabitants⁶⁵. Suriname recorded 75 fatalities in 2016 - this roughly equals to 15 fatalities per 100.000 inhabitants. This amount has remained high in the last seven years (Figure 18).

The Van 't Hogerhuysstraat records the highest number of accidents in Paramaribo, approximately 200 every year. Intersection E (Slangenhoutstraat) records the highest number - 7% - of all accidents listed in Paramaribo. On the 4th place with 2.7% of all accidents in Paramaribo is junction C (Kankantriestraat). Junction F (Industrieweg-Noord) and B (Willem Campagnestraat) are listed on place 10 and 27 with 2 and 1% of accidents reported, respectively⁶⁶.

⁶⁵ World Health Organization, 2009. Global Status Report on Road Safety. Switzerland.

⁶⁶ Mohan, V. 2013. Traffic Safety Analysis Larger Paramaribo. Thesis Master of Science Infrastructure and Logistics, Technical University Delft, Netherlands

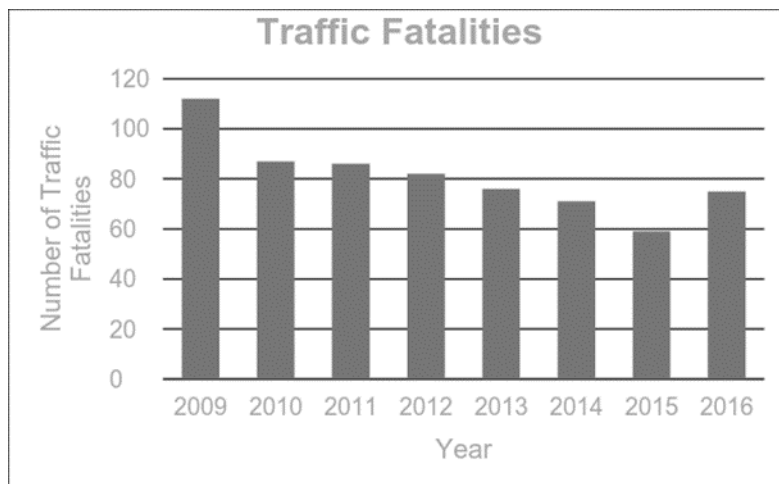


Figure 17 - Traffic fatalities in Suriname 2009-2016. Source: ABS, 2016. Mohan, 2013

Many accidents in Paramaribo are caused by slow traffic users (mopeds, cyclists and pedestrians). More than half of the collisions occur between cars and slow moving traffic: mopeds (35%), cyclist (9%) pedestrians (20%). Other collisions are between car-car (8%), moped-moped (5%) and pedestrians and moped (5%).

More males (80%) than females (20%) are prone to traffic deaths. Males generally have a higher risk for getting killed by traffic accidents. Most traffic victims occur in the age group 21-40 years.

f. Parking

Very few designated areas exist for private and public parking at the Nieuwe Haven. Both workers and visitors must park around the limited amount of parking places next to the offices. Parking on curb sides and double parking occur frequently. Designated parking areas for driving instructors waiting for police examiners are few.

5.2.8 Quality of Life

This section was compiled with information from qualitative field interviews held with residents of Abra Broki and Beekhuizen, as well as companies and Government offices operating in the study site.

General perception of the neighborhood

Beekhuizen and Abra Broki are notably different neighborhoods. While most of the interviewees in Beekhuizen have a close relationship with their neighbors, in Abra Broki most of the interviewees are rather withdrawn to their own home and daily activities. None of the interviewees in Beekhuizen would want to move to another neighborhood as they describe living in their neighborhood as ‘family-like, fun and peaceful’. In both neighborhoods, you will find at some hours of the day, young men loitering on street corners.

Safety

Generally, the area is considered moderately safe. Incidentally, incidences of crime occur near the entertainment places. Sometimes, usually outside working hours, occasional theft is reported. Abra Broki is perceived by interviewees living in Beekhuizen as the neighborhood that houses the criminals. Beekhuizen residents believe that crimes they face, such as stealing and robbing, are committed by residents from Abra Broki. Interviewees of both neighborhoods have had incidents with theft in their homes and most of them had similar answers about how safe they feel in their neighborhood, namely that they do not feel completely safe.

None of the interviewees saw a problem with construction workers coming into the area. Most answers reflected their accustomed attitude towards construction workers in the area: “they are coming in to do their job, just like everybody else” and “we are already used to this, it’s nothing new”.

Traffic

All stakeholders reflected on the discontent with the traffic in the area. Especially during rush hours, the traffic congestion and slow traffic flows cause irritation.

5.2.9 Perception about the project

It becomes clear that all, but one of the interviewees interpret the OTA proposed location site as a positive change. Mainly because the tax office will be closer to their homes, so they will be able to travel less distance for paying taxes. It must be noted that they deem the positive effect by the

decreasing distance (to the tax office for paying their taxes) more important than the negative effect of the congested traffic in the area becoming even more congested due to this project.

5.2.10 Other activities in the Area

a. Oil and Gas sector

Offices of oil and gas businesses are located in Nieuwe Haven. Two oil companies have (un)loading and storage facilities at the Nieuwe haven: Sol (a subsidiary of Shell) and Gow2 (a subsidiary of State Oil company). Both companies possess fuel storage tanks near to the study site. The Sol and Gow2 oil tanks are located 335 and 460 meter from the location of the OTA building, respectively. Fuel trucks refill at these stations for delivery to all over the country (daily 35 trucks from Gow2 and 30-45 trucks from SOL). In addition, Gow2 has also a gas station located along the Van 't Hogerhuysstraat.

b. Port handling and services

The new OTA construction will become part of what is called “Nieuwe Haven” complex, a 123.500 m² port. The port consists of a 600m long quay for cargo ships and a separate quay for bulk oil delivery. Containers are stored in the reefer station in an area of 14000 m². The port also has a way of processing waste and currently only kitchen waste is accepted, in compliance with Article 5 of the MARPOL convention⁶⁷

Suriname's port handles import goods coming from Europe, USA, China, Japan, Latin America and the Caribbean. Approximately 100.000 twenty foot containers⁶⁸ and 300,000-ton freight are handled at the port annually. This means that container trucks constantly enter and leave the Nieuwe haven for loading/unloading, especially during business hours. Several shipping, freight and transport companies are located at the Nieuwe Haven to support port operations. The port has been instrumental in importing goods for everyday life; approximately 90% of Suriname's economy is dependent on imported goods. The port is ISPS (International Ship and Port Facility

⁶⁷ The International Convention for the Prevention of Pollution from Ships (MARPOL), signed by Suriname, includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations

⁶⁸ Twenty-foot equivalent unit (TEU) is based on the volume of a 20-foot long container.

Security) certified, and have been ranked number one in the region for consecutive years. Therefore, the port undergoes frequent audits to comply with international security requirements.

c. Public services

Several public services are offered in the area that attract the general public everyday: telecommunications, stores, banks, police station, the Ministry of Trade and Industry. Also, during business hours, student drivers take their driving exam from the police located at the Nieuwe Haven. Resident of the study area use these services, especially the bank.

d. Other activities

- Two dancing places (one permanent and one incidental) are located within 500-meter distance from the proposed OTA building.
- A pharmacy is in the middle of the Nieuwe Haven complex, within 500 meter from the proposed OTA buildings. The pharmacy provides for medical supplies and medicines for people working at the Nieuwe Haven complex.

Two large-scale mining companies have offices in the Nieuwe haven complex.

6 Impact Assessment and Overview of Management Plans

This chapter provides an analysis of the potential direct and indirect impacts, both positive and negative, that will result from the proposed construction and operations phases of the Office of Tax Administration Building Project (OTA Building Project).

The criteria used to determine the significance of each impact are presented in Section 3.2.2.

A key aspect of the impact assessment methodology is the application of appropriate and practicable management measures that the consultants recommend to address impacts. The management measures are classified as mitigation measures intended to avoid, minimize and/or reduce potential negative impacts and optimization measures intended to generate, maximize and/or enhance potential benefits of the project. The significance of each potential impact is also rated after the application of mitigation/optimization. Key management measures are presented in each impact table and a comprehensive suite of relevant mitigation and optimization measures is summarized at the end of each of the sections on biophysical impacts. The consultants recommend that all mitigation and optimization measures are implemented.

However, where impacts are already rated low, or negligible prior to mitigation/optimization, NIMOS or IADB should consider whether these are regarded as essential, especially where implementation entails excessive costs. Recommendations regarding monitoring requirements are also presented in this chapter.

It is critical that mechanisms are in place before each phase (construction and operations) of the project to ensure that the recommended mitigation and optimization measures presented in this chapter are fully and effectively implemented. A customized management plan is compiled and should be implemented to guide environmental and social management during the project. The management plan compiled for the proposed OTA Building Project includes an Environmental and Social Management and Monitoring Plan (ESMP)

An overview of these plans is provided in this chapter.

6.1 Potential Biophysical Impacts

This section describes and assesses the potential impacts of the project on the physical environment (geology, soils, air and water) and the biological environment (terrestrial and aquatic ecology), as well as the potential noise impacts of the project.

6.1.1 Soils, Landscape and Land Use

The potential impacts during the construction and operations phase on the geology and soils of the project site, are assessed below.

6.1.2 Potential contamination of soil resources

Leaks and spills from vehicles, machinery and handling of potential pollutants during the construction and operations phases of the proposed OTA Building Project may potentially contaminate soil resources. This could directly affect the shallow groundwater in the project site. Field test of the soil were not required for this study, and thus no evidence of localized contamination of soil resources on the proposed project site can be presented.

The quantities of pollutants that may be released into the environment from leaks and spills are unintended, but these are likely to be small during normal construction and operations phase activities. Nevertheless, such leaks and spills, and the resulting impact on soil resources, may occur frequently. The impact is considered reversible but would be medium-term if no mitigation measures are implemented, as natural remediation of contaminated soil is a long-term process. The potential impact of contamination of soil resources from small leaks and spills during the construction and operations phases is therefore considered to be of minor effect with mitigation measures (Table 20). The implementation of the recommended mitigation measures would result in a reduced likelihood of the impact occurring and a shorter impact duration (as spills would be cleaned up immediately). Therefore, the residual impact is considered insignificant.

Table 20 - Significance of potential contamination of soil resources from small leaks and spills.

Environmental Impact:		Potential contamination of soil resources from small leaks and spills.				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	MT	MS	Medium	Minor
Key mitigation measures/Recommendations:						
• Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks.						
• Use spill prevention measures such as drip trays during refuelling, bunds around storage tanks, etc. to capture spills and contain any leaks.						
• Ensure all on site staff are trained in the use of spill prevention measures						
• Clean up any spills (including existing spills) immediately, through containment and removal of free product and appropriate rehabilitation or disposal of contaminated soils.						
With mitigation						
	Magnitude	Duration	Scale	Probability	Overall	
	Negligible	ST	SS	Low	Negligible	

6.1.3 Landscape changes (visual impacts)

The project site is located in a landscape with few readily discernible landscape features. The area has been substantially altered by human activities, in particular the industrial and commercial activities along Van 't Hogerhuysstraat and on the bank of the Suriname River near Nieuwe Haven Complex.

The project site is in an urban area with a relatively populated residential area to the south and the west. The area experiences significant construction activity, vehicular movements and other human activities from new developments in the Nieuwe Haven Complex. The number of development plans⁶⁹ in the area indicates that this trend is ongoing and likely to intensify. During the construction phase, aesthetic impacts of potential dust pollution will detract from the already-changing character of the area. Therefore, the additional activities proposed are expected to be hardly noticeable against the background of existing industrial and construction activities near the project site.

The proposed OTA Building Project will not change the current landscape character, but will contribute to the continuing development of the area. The potential impact of the proposed OTA Building Project on the landscape is localized and of negligible effect. The impact during the construction and operations phases is therefore assessed to be of negligible effect, with or without the implementation of the recommended mitigation measures (Table 21).

⁶⁹ Interview with Director and Staff of N.V. Havenbeheer on 9th March 2017 and Customs on 10th of March 2017

Table 21 - Significance of impact on landscape (visual quality)

Environmental Impact:		Landscape changes (visual impacts)				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	SS	Low	Negligible
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Create green areas and/or plant trees around the perimeter of the site to act as a visual screen between building complex and nearby visual receptors. 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	LT	SS	Low	Negligible

6.1.4 Impact on Land Use

Land uses near the project site comprise industrial, commercial and residential activities. There are no formal land use policies or plans for the area⁷⁰. Several industrial/commercial and residential developments are in progress or are planned.

The land use potential of the areas surrounding the project site is already limited by existing commercial and industrial activities in the area. The potential impact of the OTA building on existing and potential land use in the surrounding area during the construction and operations phases is therefore considered to be of low intensity. The impact will be localized and of long term duration (for the lifetime of the building) and therefore is assessed to have a negligible effect, with or without the implementation of the recommended mitigation measures (Table 22).

Table 22 - Significance of impact on land use.

Environmental Impact:		Impact on land use				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	LT	SS	Low	Negligible
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Create green areas and/or plant trees around the perimeter of the site to act as a visual screen between building complex and nearby visual receptors. . 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	LT	SS	Low	Negligible

⁷⁰ Interview with staff of Ministry of Public Works, Transport and Communication on 9th of March 2017

6.1.5 Air Quality

Paramaribo is characterized by high average temperatures and high humidity and rainfall. The High humidity builds resilience for dust and gases and this leads to their wider dispersion while the latter would tend to limit dispersion.

In the area, existing air quality is influenced by the Port activities and traffic (vehicular emissions)

6.1.5.1 Emissions

Emissions can occur during the preparation of the land (e.g. demolition of existing infrastructure, land clearing, and earth moving), and during construction. They can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions.

The expected air pollutants emitted from the construction site that can influence the air quality in surrounding areas, are:

- Emissions from mobile equipment, and
- Dust as result from increased traffic, vehicular movements, piling of construction material, and landscaping.

Air pollution from cars and trucks is split into primary and secondary pollution. Primary pollution is emitted directly into the atmosphere; secondary pollution results from chemical reactions between pollutants in the atmosphere. The following are the major pollutants from motor vehicles⁷¹:

- Particulate matter (PM). Fine particles (PM_{2.5} and PM₁₀) pose the most serious threat to human health, as they can penetrate deep into lungs. PM is a direct (primary) pollution and a secondary pollution from hydrocarbons, nitrogen oxides (NO_x), and sulfur dioxides (SO_x). Diesel exhaust is a major contributor to PM pollution.
- Hydrocarbons (HC). These pollutants react with nitrogen oxides in the presence of sunlight to form ground level ozone, a primary ingredient in smog. Though beneficial in the upper atmosphere, at the ground level, this gas irritates the respiratory system of humans, causing

⁷¹ <http://www.ucsusa.org/clean-vehicles/vehicles-air-pollution-and-human-health/cars-trucks-air-pollution#.WMfLUvk1-00>

coughing, choking, and reduced lung capacity.

- Nitrogen oxides (NO_x). These pollutants cause lung irritation and weaken the human body's defenses against respiratory infections such as pneumonia and influenza. In addition, they assist in the formation of ground level ozone and particulate matter.
- Carbon monoxide (CO). This odorless, colorless, and poisonous gas is formed by the combustion of fossil fuels such as gasoline and is emitted primarily from cars and trucks. When inhaled, CO blocks oxygen from the brain, heart, and other vital organs. Fetuses, newborn children, and people with chronic illnesses are especially susceptible to the effects of CO.
- Sulfur dioxide (SO₂). Motor vehicles create this pollutant by burning sulfur-containing fuels, especially diesel. Sulfur dioxide can react in the atmosphere to form fine particles and poses the largest health risk to young children and asthmatics.
- Hazardous air pollutants (toxics). These chemical compounds (including Benzene, acetaldehyde, and 1,3-butadiene) have been linked to birth defects, cancer, and other serious illnesses.
- Greenhouse gases. Motor vehicles also emit pollutants, such as carbon dioxide, that contribute to global climate change.

6.1.5.2 Air quality impacts

The air quality in the study area is influenced by emissions from several industrial activities in the area, such as the Port, facilities of SOL, and GoW2 as well as various other sources, especially the traffic at the Van 't Hogerhuysstraat and the Wijdenbosch Bridge. No comprehensive air emissions inventory for the study area is available.

During construction, potential sources of air quality impacts include wind-blown sand exposed during earthworks and exhaust fumes of construction/drilling equipment. The magnitude of potential air quality impacts from the above sources is considered to have medium effect on the environment, as:

- Earthworks will take place;

- Construction materials, such as sands, will be transported to and stocked on site;
- Number of heavy equipment will increase
- Emissions of exhaust fumes

It is also expected that the traffic at the main roads in the vicinity of the project area will increase due to transport of construction material and workers. Consequently, the duration of traffic jams might also be longer, causing more emissions of exhaust fumes, noise and vibrations.

The impacts from the construction phase are expected to be medium-term (only during construction lifetime). The potential impact of reduced air quality on surrounding communities during the construction phase therefore is assessed to be of moderate effect, but with the implementation of mitigation measures it can be reduced to negligible effects (Table 23).

Table 23 - Significance of reduction in air quality and impaired human health due to construction phase emissions.

Environmental Impact:		Reduction in air quality and impaired human health				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	MT	SS	Medium	Moderate
Key mitigation measures/Recommendations:						
• Maintain all generators, vehicles, and other equipment in good working order to minimise exhaust fumes						
• Cover stockpiles of dry, loose material with netting or similar to avoid dust, especially during windy and dry conditions						
• Spray access roads with water during windy and dry conditions						
• Maintain speed limits for the access roads						
• Discuss with relevant authorities the possibilities for creating an alternative access						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	MT	SS	Medium	Minor

During operation, the impacts on air quality are considered moderate due to the increase traffic, but with the implementation of the mitigation measures the impacts can be reduced to minor effects.

6.1.6 Impacts on Climate Change

The movement of construction vehicles and the transport of construction materials, equipment and workers to and from the work sites during construction phase, and movement of staff and clients during operations phase may affect road traffic. The number and duration of the traffic jams is expected to increase, resulting in the increase of greenhouse emissions that will contribute to climate change. Therefore, the impacts from air emissions to climate change are considered of moderate effect during both the construction and operations phase. With the implementation of the mitigation measures, those impacts can be reduced to minor effects (Table 24)

Table 24 - Significance of impacts on climate change

Environmental Impact:		Impacts on climate change				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	MT	SS	Medium	Moderate
Key mitigation measures/Recommendations:						
• Maintain all generators, vehicles, and other equipment in good working order to minimise exhaust fumes						
• Develop and implement energy use policy for the buildings in the operations phase						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	MT	SS	Medium	Minor

6.1.7 Noise and ground vibration impacts

Detailed noise measurements are unavailable for the study area. Noise-generating sources during the construction phase of the OTA Building project will include construction vehicle movements, machinery and pile driving activities. The assessment of noise impact on the surrounding communities during the construction phase is based on qualitative assumptions.

It is expected that the impact will be temporary (at most for the duration of the construction phase, although not all construction phase activities will generate the same level of noise), and will be localized. The intensity of the potential impact is rated as high, due to the uncertainties around the noise-generating activities on site and the potentially very intrusive noise generated by piling activities. The potential impact of noise on surrounding communities during the construction phase is therefore assessed to be of moderate effect (Table 25). The implementation of the recommended mitigation measures would reduce the significance of the impact to minor effects.

Table 25 - Significance of impact of noise on surrounding communities during the construction phase.

Environmental Impact:		Noise impacts				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	ST	MS	High	Moderate
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> • Maintain all equipment in proper working order to avoid excessive noise generation • If complaints regarding noise are received from residents, consider installing partial screening around the noisiest activities and/or mufflers on noisy equipment • Where possible, restrict working times during construction to between 7 am and 5 pm on weekdays. No pile driving activities in the weekends. Notify any nearby receptors if construction work is planned outside of those times 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Medium	ST	MS	Low	Minor

In contrast to noise, pile driving may pose major impacts to the surrounding infrastructures (e.g. the tank farms and the fueling stations of GoW2 and SOL, the structures of the Port, etc.). In general, the vibrations due to pile driving vary with the soil properties, the stiffness and grouping of the piles. When a pile penetrates easily into the ground, the intensity of transmitted vibrations will be low. However, vibrations increase when denser soil layers are encountered and pile penetration speed decreases. Ground vibrations thus depend on the geotechnical conditions which need to be assessed thoroughly. During the initial phase of pile penetration, the source of vibrations will be located close to the ground surface. However, when the pile penetrates deeper into the ground, the source of vibrations becomes more complex. Vibrations can be emitted from the toe of the pile but also along the pile shaft. Therefore, geotechnical conditions are of great importance when trying to predict the intensity of ground vibrations. It is important to know the location of hard soil layers through which the pile will be driven since they may give rise to strong ground vibrations.

Depending on the method used for driving the piles, the magnitude of the impact can be high with irreparable damage to the surrounding infrastructure (Table 26), leading to higher costs and possible fines for the project. It is therefore very important to obtain correct information on the geomorphology and geotechnical characteristics of the project site to be able to select the most appropriate pile driving methodology.

Table 26 - Significance of impact of ground vibrations due to pile driving on surrounding infrastructure during the construction phase

Environmental Impact:		Ground vibrations due to pile driving causing damage to surrounding infrastructure				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	High	MT	MS	Medium	Major
Key mitigation measures/Recommendations:						
• Carry out detailed geomorphological study to obtain information regarding the soil layers						
• Carry out soil strenght measurements for better decision making on pile driving method and number of piles						
• Monitor groundvibrations during pile driving activities						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Medium	ST	SS	Medium	Minor

Noise and vibrations during the operations phase are likely to be caused by light vehicles of employees and customers but are unlikely to cause damage or annoyance as light vehicles and heavy trucks already use roads in the area. Therefore, the expected changes in ambient noise levels in the areas surrounding the OTA Building will be unnoticeable in the surrounding communities and the potential impact is negligible. Although mitigation measures are not required, the following are recommended as best practice and will ensure that any potential noise impacts of the OTA building during the operations phase are kept to a minimum:

- Create green areas and/or plant trees around the perimeter of the site to act as a visual screen between office complex and nearby visual receptors, especially for the areas to the south and the west.
- Schedule noise-generating activities that are unrelated to the continuous operation of the office complex, e.g. repairs/maintenance, during business hours.

6.1.8 Water Resources

The Suriname River near the office complex site is extensively used by ships and small boats. The river at that part is not used as a source of potable water, irrigation, water for livestock, recreation or fisheries. The groundwater is also not used as potable water or for other uses in the wider area (e.g. Paramaribo)

Impacts on the ground- and surface water resources near the project site could result from the following project activities/aspects:

- Construction activities including excavation and dewatering of shallow groundwater;
- Leaks and spills; and
- Discharge of stormwater

6.1.8.1 Potential increased turbidity and sedimentation in the Suriname River

Exposed soil on the project site and adjacent area could be disturbed through the movement of construction vehicles on site. Exposed soil could be washed into the Suriname River by stormwater and blown in during windy periods, which could result in increased turbidity and sediment loads in the river.

The area of disturbed soil and movement of vehicles will be restricted to the proposed project site, and therefore, the potential for increased turbidity and sedimentation in the Suriname River is limited. In addition, the Suriname River already has high turbidity and sediment load and, given the size of the river, any sediment discharged into the river because of construction activities would create only a negligible increase in turbidity/sediment load.

The potential impact of increased turbidity and sedimentation in the Suriname River during the construction phase of the project therefore is assessed to be minor, but this impact will be negligible after the implementation of the mitigation measures (Table 27). Good housekeeping practices during the construction phase would further limit any effects of this impact.

Table 27 - Significance of impact of increased turbidity and sedimentation in the Suriname River during the construction phase.

Environmental Impact:		Impact of increased turbidity and sedimentation in the Suriname River during the construction phase				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	MT	SS	Low	Negligible
Key mitigation measures/Recommendations:						
• Movement of vehicles should be restricted to the proposed project site						
• Maintain a drainage canal that capture all storm water from the project site before it enters the Suriname river. This will retain as much sediment as possible.						
• Good housekeeping practices (e.g. clean up any spills immediately)						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	SS	Low	Negligible

Once the OTA building is operational, new hard surfaces and good housekeeping are unlikely to result in increased turbidity or sedimentation in the Suriname River.

6.1.8.2 Potential contamination of the Suriname River through stormwater discharge

During construction and operation of the OTA building, small volumes of pollutants (e.g. hydrocarbons, cleaning solvents, cement, oils, etc.) because of leaks and small spills, have the potential to enter the Suriname River through stormwater. Any unregulated dumping of waste materials (construction rubble, waste oil, etc.) into the river would contribute to the volume of contaminants released into the river as a result of project activities.

The proposed OTA Building project may therefore have impact on the water quality in the Suriname River through the run-off contaminated stormwater. It is impossible to know the quantities of potential contaminants that may be released into the environment from accidental leaks and spills at the project site (since these are not intended), but volumes are likely to be small during normal construction and operation phase activities.

Due to vigorous mixing and the elevated capacity for dilution in the Suriname River, and considering the small volumes likely to be involved, the overall potential impact of stormwater discharge on surface water quality caused by small leaks and spills during normal construction phase activities would be localized and of low intensity. Small leaks and spills on site during construction may occur frequently, but any impact would be reversible (of short-term duration). The potential contamination of the Suriname River through stormwater discharge during the construction phase therefore is assessed to be of very low significance (Table 28). The implementation of the recommended mitigation measures would reduce the likelihood of any impact occurring and would result in an insignificant residual impact.

Table 28 - Significance of potential contamination of the Suriname River through stormwater discharge during the construction phase.

Environmental Impact:		Contamination of the Suriname River through stormwater discharge				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	SS	Medium	Negligible
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Maintain a drainage canal that capture all storm water from the project site before it enters the Suriname river. This will retain as much sediment as possible. Good housekeeping practices (e.g. clean up any spills immediately) 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Negligible	ST	SS	Low	Negligible

6.1.8.3 Potential contamination of Suriname River through wastewater discharge

The discharge of wastewater from washing rooms through the ditch into the Suriname River is a potential threat to the water quality (

Table 29). However, the use of portable chemical toilets, which is a common practice in construction projects, will reduce this risk to negligible effect. During the operations phase all toilet water will have to be treated through the septic tanks prior its discharge into the environment. Although Suriname does not have specific standards for the design and construction of septic tanks, it is common practice nowadays to have septic tanks with 3 compartment-systems. For that, the Guyana code of practice for the design and construction of septic tanks and associated secondary treatment and disposal systems⁷², is recommended to be used. Desludging should be done every two years, and inspection of the tank should take place every 12 to 18 months. The inspection should be directed towards the determination of the following:

- a. The depth of accumulation of sludge over the tank bottom; and
- b. The depth of the scum.

Canteens are required to have separate grease traps to retain as much grease as possible. These grease traps have to comply with the requirements of the Bureau for Public Health (BOG).

Surface water quality at end-of-pipe and in the Suriname River at two points (up and downstream from the discharge point) will be monitored on monthly basis. Groundwater from two monitoring wells also will be sampled each month. Parameters to be analyzed will include at least the following: pH, Dissolved Oxygen, Redox, Conductivity, *Escherichia coli* and Total coliforms. Water quality monitoring can be done by the University of Suriname. Through the monthly monitoring of the water quality, the potential impact of wastewater both during the construction and operation phase can be maintained to negligible level.

⁷² Guyana National Bureau of Standards (2007). Code of practice for the design and construction of septic tanks and associated secondary treatment and disposal systems

Table 29 - Significance of potential contamination of the Suriname River

Environmental Impact:		Potential contamination of Suriname River through waste water				
Without mitigation	Positive/ Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	SS	Low	Negligible
Key mitigation measures/Recommendations:						
• Use portable chemical toilets during the construction phase						
• Toilet waters to be flushed into septic tanks prior discharge to the environment during operations phase						
• Canteens to be provided with grease traps to retain as much grease as possible						
Desludging of septic tanks to be done every two years						
Carry out inspection of the tank every 12 to 18 months						
• Carry out monthly monitoring of water quality (surface and groundwater for pH, Dissolved Oxygen, Redox, Conductivity, Escherichia coli and Total coliforms)						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Negligible	ST	SS	Low	Negligible

6.1.8.4 Potential contamination of groundwater resources

Shallow groundwater in the introduced sand layer on the project site may require dewatering to allow construction of foundations and supporting structures. Such dewatering may result in eventually contaminated shallow groundwater from the surrounding migrating towards the dewatered area where shallow groundwater may not be contaminated, facilitating the spread of the contamination.

Leaks and spills of contaminants on land during construction and operations phase activities also have the potential to contaminate underlying groundwater. Contamination is unlikely to penetrate

further than the localized, shallow groundwater under the project site because of the extensive underlying impermeable geological layers. The underlying groundwater resources from which most groundwater is abstracted for public use in Paramaribo are unlikely to be affected, as it is known that they are hydraulically unconnected to the shallow groundwater on the existing project site. However, the stormwater drain system is in hydraulic connection with the shallow groundwater and any contamination of the latter therefore has the potential to affect surface water quality in the canal and ultimately the Suriname River, although the volumes involved would be limited.

As any contamination of groundwater resources during the construction and operations phase is likely to be contained within the shallow, localized groundwater on the project site, the impact will be localized and of low intensity, regardless of the volumes of contaminants released into the environment or duration of the any dewatering activities. The potential impact of contamination of groundwater resources therefore is assessed to be minor (Table 30). The implementation of the recommended mitigation measures would reduce the likelihood of the impact occurring, and the residual impact would be negligible.

Table 30 - Significance of potential contamination of groundwater resources.

Environmental Impact:		Potential contamination of groundwater resources				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	MT	MS	Medium	Minor
Key mitigation measures/Recommendations:						
• Use drainage canal to receive discharge from dewatering						
• Stormwater to be lead into the drainage canal						
• Ensure drainage canal to the Suriname River is well maintained and contain macrophytes to retain pollutants						
• Clean up any spills immediately, through containment and removal of contaminated soils						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Negligible	ST	SS	Low	Negligible

6.1.9 Impacts from solid waste

During construction lots of waste will be generated. Construction waste may be generated from site clearance, landscaping, demolition of existing buildings and road works. Demolition of the existing buildings will produce mainly salvage materials (e.g. wood, roofs of corrugated iron, and some concrete debris). The wood and roofs can be used for the construction of the temporary

facilities for the workers during the construction phase. When the project is completed these temporary facilities will have to be demolished. Materials that are produced can either be reused or disposed of at the public landfill. Concrete debris can be used as landfill of the riverside. In addition, packaging materials, disposable (kitchen) material from the workers, etc. will also be produced at the construction site. During the operations phase, it is expected to have more office waste, such as papers, disposable material, spent batteries, etc.

Waste recycling possibilities are still limited in Suriname. Therefore more than 95% of the generated waste will be disposed of in the public landfill at Onoribo.

The impacts from solid waste is considered to be minor during both the construction and operations phase. With the implementation of the mitigation measures, those impacts will be reduced to negligible effects (Table 31)

Table 31 - Significance of impacts from solid waste

Environmental Impact:		Impacts from solid waste				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	MT	SS	Medium	Minor
Key mitigation measures/Recommendations:						
• Develop and prepare waste management plan for both construction and operations phase						
• Reused demolished materials for the construction of the temporary facilities for workers during the construction phase						
• Contact the Association of local construction contractors (Algemene Aannemers Vereniging - AAV) for the reuse of demolition materials						
• Use Concrete debris as landfill of the riverside						
• Identify local waste handlers to encourage recycling or re-use of some waste types						
• Place separate waste collector for different types of waste at the project site						
• Adopt proper policy for purchasing product to reduce waste production (product stewardship)						
With mitigation						
	Magnitude	Duration	Scale	Probability	Overall	
	Negligible	ST	SS	Low	Negligible	

6.1.10 Potential impact of flooding

The INDC report of 2015 ⁷³ mentioned that “The Republic of Suriname is most vulnerable to the effects of climate change due to its low-lying coastal nature and threats of increased sea level rise

⁷³ Republic Suriname (2015). Intended Nationally Determined Contribution

and the frequency of extreme weather events”. As the project site is abutting the Suriname River at a section that is influenced by the tide, flooding due to sea level rise can be considered a potential moderate risk to the building complex at long-term. Therefore, the creation of a sheet piling curtain at the river bank will be necessary to intercept the water flow from the river. Based on the sea level rise projection by Rahmstorf (2007)⁷⁴, the level of foundation of the new buildings should be at least 1.5 m above ground level. Careful considerations should be made for the type of foundations to avoid stressing the building due to humidity or water runoff.

In addition, flooding as consequence from the combination of spring tide and high intensity rainfall may occur at short term and with more frequency due to the weather conditions in the country. It is recommended to prepare a flood response plan for monitoring and responding to emergency conditions arising from high water levels on the Suriname River. A pump system that is able to pump out excessive water to the river should be installed during the construction and operations phase. Furthermore, the drainage channels should be maintained clean at all time.

Through the implementation of these mitigation measures the potential impacts of flooding can be reduced to minor effect (Table 32).

Table 32 - Significance of impacts from flooding

Environmental Impact:		Impact from Flooding				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	MT	SS	Medium	Moderate
Key mitigation measures/Recommendations:						
• Create sheet piling curtain at the river bank						
• Have pump system installed to pump out excessive water						
• Maintain drainage always clean						
• Ensure that the level of foundation of the new buildings is at least 1.0 m above ground level.						
• Take into consideration the type of foundations to avoid stressing the building due to humidity or water runoff						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	SS	Medium	Minor

⁷⁴ Rahmstorf (2007). A Semi-Empirical Approach to Projecting Future Sea-Level Rise

6.2 Social Impact Assessment and Management Measures

A. During Construction

6.2.1 Demolition and Resettlement

The project involves the demolition of eight buildings that are currently present at the construction area. One building is being rented to the public for parties and other entertainment activities, and for this service, income is generated. The other seven buildings house offices, storage area and the technical department of customs. The demolition should be planned and anticipate risks such as incidence of communicable disease, health and safety for workers and the public. This risk assessment should lead, among others, to the preparation of a demolition schedule that includes the methodology to be applied; a traffic control plan for the entry and exit of heavy equipment to the site; an emergency response plan for injury accidents and oil spills accidents. In order to reduce the risks of incidents with workers, it is recommended to initiate with mechanical demolition before the manual. For proper disposal of demolition debris, see section 6.1.9.

In addition, at least four weeks before the commencement of the scheduled demolition, each building and the surrounding area should be surveyed by professional pest control firm in order to identify the presence and extent of any infestations. Where infestations are identified, appropriate treatments must be implemented to eliminate infestation before demolition.

After the demolition, the government offices and entertainment venue must permanently move to another location. Resettlement should be completed before construction begins because it poses a safety risk to the current inhabitants. The current inhabitants are expected to terminate activities for a short period because they should pack, move and set up the office at the new location. Impairment of social functions are thus expected to occur at the project site, leading to an overall minor social impact (Table 33).

The implementation of recommended management measures would reduce the intensity of the negative impact, because inhabitants are expected to be informed, consulted and prepared for the move. The overall impact then becomes negligible.

Table 33 - Significance of impact of construction on resettlement

Social Impact:		Resettlement				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	ST	SS	High	Minor
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Establish and maintain open communication and transparency with current inhabitants of buildings 						
Develop a demolition plan, including communicable diseases, health and safety of workers, nuisance from dust and noise						
<ul style="list-style-type: none"> Negotiate a resettlement plan with affected stakeholders according to the national laws, including budget and schedule 						
<ul style="list-style-type: none"> Monitor and evaluate the implementation of the demolition and resettlement plan 						
<ul style="list-style-type: none"> Carry out a risk assessment for the demolition process to produce a demolition schedule; prepare an emergency plan 						
<ul style="list-style-type: none"> Prepare a demolition schedule and determine the demolition methodology 						
<ul style="list-style-type: none"> Develop an emergency response plan for injury accidents and oil spill accidents 						
<ul style="list-style-type: none"> Prepare a traffic control plan for the entry and exit of heavy equipment to the site 						
<ul style="list-style-type: none"> Ensure a pest survey is done by a professional pest control firm 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	SS	High	Negligible

6.2.2 Labor and Working Conditions

Labor and working conditions at the site should promote fair treatment of employees and compliance with national labor laws. The Suriname Safety Act 1947 outlines condition for safe working conditions. The construction sector is prone to heavy workloads/extended working hours and this has been widely practiced, making construction has the 3th highest number of casualties in Suriname. In case daily working hours need extension above the legally allowed 8.5 hours or on Sundays/holidays, a special permit is required. However, now that Suriname exists in an economic depression, construction workers can become motivated to work extra hours, which can cause fatigue and pose a safety risk.

Construction work is characterized by short-term labor with low-entry levels; no diplomas are required which makes workers easily replaceable. Labor rights of short-term workers often are neglected and therefore efforts should be made to protect such rights in the same way as full-time workers.

In case labor rights are violated, construction workers should have an opportunity to complain. Mechanisms to handle grievances in projects are not required under Suriname law and therefore are often non-existent. Grievance redress should be available to protect all construction workers against unfair and unsafe workplaces.

Violation of labor and working conditions can occur at the building site during the time of construction. Labor rights violations are expected to have low-level damage to the social function of the workers, leading to an overall negligible impact (Table 34). The implementation of recommended management measures wouldn't reduce the intensity of the negative impact, because the safety risk will stay the same. However, the measure will stimulate good working relations and fair treatment, an indicator of a better quality of life at the job site.

Table 34 - Significance of impact of construction on labor rights violation

Social Impact:		Violation labor rights				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	SS	Medium	Negligible
Key mitigation measures/Recommendations:						
• Raise workers' awareness about labor rights with a short mandatory video						
• Post posters explaining workers' rights on strategic locations on site						
• Project management should plan and monitor over-work hours						
• Establishment of grievance redress mechanism						
• Workers, contractors and subcontractors are hired based on the existing labor rights policies (gender inclusion and equal treatment of workers)						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	SS	Medium	Negligible

6.2.3 Gender Equality

Women are generally in a lower position in the male-dominated construction sector. Equal treatment of women in terms of hiring and firing are necessary, as well as, special provisions for women (bathroom etc.) should be provided on site. The construction sector is generally rough and situations of verbal harassment may occur. In case the building will require permanent labor to be on site (prefab materials), they leave home for long periods of time, and their partners may end up with extra chores.

Conditions for gender inequality can occur at the building site during the time of construction, and are expected to have low disruption to the social function of workers, leading to an overall negligible impact (Table 35). The management measures will improve gender equality, and decreasing the probability of such incidences occurring.

Table 35 - Significance of impact of construction on gender equality

Social Impact:		Gender Equality				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	SS	Medium	Negligible
Key mitigation measures/Recommendations:						
• Raise workers' awareness about gender equality with a short mandatory video						
• Post posters explaining women's rights on strategic locations on site						
• Prepare and implement a harassment and violence policy						
• Appoint a women handling women issues incl. gender equality						
• Have a gender-sensitive hiring policy						
• Ensure hygienic facilities on site						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	SS	Low	Negligible

6.2.4 Occupational Health and Safety

Health and safety hazards include those that come from physical, chemical and other hazards associated with the construction process. Building a multi-story building can pose dangers to workers falling or getting struck by falling objects which can cause injury to head, eyes other body parts, and death. Workers also are prone to injuries coming from manual handling of building materials and tools, such as sawing, grinding etc. Unexpected moving objects from on-site traffic can put workers at risk. Workers also can slip and fall in places that are not properly maintained. Workers can get injury from repetitive motion, over-exertion, and manual handling. In addition, workers are prone to waste hazards coming from lubricants that leaked into the soil.

Construction-related occupational health and safety hazards are expected to occur inside and outside the fences of the construction site (the latter because of moving objects). The overall impact is categorized as moderate. (Table 36). The implementation of recommended management measures (in compliance with the local safety laws and regulations) would reduce the probability of a health and safety injury because protective measures are taken. The overall impact then becomes minor.

Table 36 -: Significance of impact for occupational hazards

Social Impact:		Occupational health and safety				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	High	ST	SS	High	Moderate
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Promote use of Personal Protective Equipment (PPE) on site: safety glasses, plastic helmets, ear plugs, safety shoes, and gloves 						
<ul style="list-style-type: none"> Show instruction video how to use PPE 						
<ul style="list-style-type: none"> Keep clear traffic ways on site and speed limits 						
<ul style="list-style-type: none"> Keep designated areas for material handling 						
<ul style="list-style-type: none"> Implement general Health and Safety Plan 						
Give training for workers to handle risks associated with heights confined spaces, hot work and mechanical lifting of load						
Promote use of fall protection devices, such as rails or other barriers able to support a weight of 200 pounds						
Develop fire prevention plan for hot work and other fire hazards						
Selection of tools and workstations that reduce force requirements and holding times						
Implement administrative controls into work processes, such as job rotations and rest or stretch breaks						
Require licences and work permits for hazard-prone tasks						
With mitigation	Magnitude		Duration	Scale	Probability	Overall
	High		ST	SS	Low	Minor

6.2.5 Nuisance

The building construction project comes with release of dust, noise and vibration. Moving earth and materials can cause excessive noise and dust release on site, as well as surrounding areas e.g. access roads. Besides this, surrounding communities and workers will hear sound associated with driving of poles which is necessary for the construction of the multistory buildings. The potential impact of nuisance is expected for the short term, only during project construction. The effect is minor (Table 37) and may also be felt outside the construction site – business offices, visitors and workers operating outside in the harbor, and the residential areas of Beekhuizen and Abra Broki. The implementation of recommended management measures would reduce the probability of nuisance having effect on construction workers to negligible. However, the impact of nuisance on surrounding businesses and residential areas is still present. Therefore, the overall impact stays minor.

Table 37 - Significance of impact for nuisance (noise, vibration, dust)

Social Impact:		Nuisance				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	MS	High	Minor
Key mitigation measures/Recommendations:						
• Instruct workers to wear protective equipment - ear plugs, eye goggles						
• Post warning signs in areas of high noise and dust levels instructing workers to wear protective equipment						
• In the dry season, spraying against dust release will be promoted						
• Develop and implement a Health and Safety education program for workers						
• Install a siren for announcement of excessive vibration when diving poles						
• Disseminate a pamphlet to surrounding communities to inform them about times/dates of nuisance						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	MS	High	Minor

6.2.6 Community Health and Safety

Community and workers should be protected from physical, chemical and other hazards associated with the building construction. The social risks identified are described below.

Traffic and traffic-related accidents

The construction activities increase the use of (heavy) vehicles for earth movement, supply/discharge of materials and transportation of persons. Managing the risk of traffic-related accidents and injuries should include the adoption of safety measures on the roads. This is particular important because workers and other road users are using the high-occupied Van ‘t Hogerhuysstraat. The potential impact of construction-related traffic is for the medium term. The effect is expected to expand to all main roads in the area – until Poelepantje in the West, Latourweg in the South, Downtown in the North (outside the study area). The impact can be overall categorized as major (Table 38). The implementation of recommended management measures would reduce the intensity of traffic and traffic related accidents. The overall impact then becomes moderate.

Table 38 - Significance of construction on traffic and traffic-related accidents

Social Impact:		Traffic and traffic-related accidents				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	MT	LS	High	Major
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Minimize pedestrian interaction with construction and supply vehicles by construction of pedestrian walkways Collaborate with authorities to improve signage, visibility and overall safety of roads (Road Improvement Plan) Educate workers and local communities about the changing situation during construction with a flyer Dedicate persons to warn road users about changing conditions with signs Have medical officer on site to provide first aid services in case of injuries on site Coordinate with the nearest emergency room (Academic Hospital) to provide services in case of accidents on site, and with helicopter ambulance services Police regulation to regulate crossing of residential areas /main road 						
Conduct a study on traffic flow and safety						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	MT	LS	High	Moderate

6.2.7 Disruption of activities in the area

The Nieuwe Haven is an industrial complex where several activities take place, such as port services, public services (bank, telephone, gas station), law enforcement (police), medical services, business offices and government services. The influx of construction workers and building material will interfere with ongoing operations of these public and private undertakings. Impact from construction will be short and have effect in the whole industrial complex and has a high probability to occur. The overall impact is negligible (Table 39). The implementation of recommended management measures wouldn't change the overall negligible impact. However, the management measures will improve relations with affected stakeholders, and this may improve the quality of life during construction.

Table 39 - Significance of impact of construction on activities in the area

Social Impact:		Ongoing activities in the area				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	LS	High	Negligible
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Inform surrounding businesses weekly about planned activities for the next week and expected disruptions Collaborate with surrounding businesses to find solutions to problems that may arise from disruption 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	LS	High	Negligible

6.2.8 Security and Crime

Construction workers usually come with a typical social behavior - which is less polished than social behavior held in mainstream society. Besides this risk, the site is in an area with adjacent residential areas belonging to the worst of Paramaribo in terms of crime and unwanted social behavior. An influx of workers occasionally drinking at the neighborhood stores in the area can cause tensions with residents. A higher population of workers can also cause increased risk of inadvertent or intentional trespassing to the construction site. . If trespassing occurs, construction workers can be endangered because the trespasser(s) may be unaware of site rules and potentially can encounter hazardous materials and conditions.

The impact is expected to be short-term and will be felt in the Nieuwe haven and then two residential areas. The impact can be overall categorized as minor (Table 40). The implementation of recommended management measures would reduce the probability of crime occurring because of fencing of the construction site. The overall impact then becomes negligible.

Table 40 - Significance of impact on security and crime

Social Impact:		Security and crime				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	ST	MS	Medium	Minor
Key mitigation measures/Recommendations:						
• Coordinate with local police (Nieuwe Haven) to understand neighborhood crime/social behavior patterns						
• Fence construction site and appoint manned security to control gates						
• Monitor crime and unwanted social behavior						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	ST	MS	Low	Negligible

6.2.9 Disease prevention

Increased incidence of communicable (sexually-transmitted diseases, such as HIV/AIDS) and vector-borne diseases can pose a threat to anyone working/residing in the Nieuwe Haven complex and surrounding residential areas. Communicable diseases are caused by the social behavior of in-fluxing worker. For vector-borne diseases there is a higher risk because of the close vicinity to the Suriname River, and Abra Broki, the residential area to the west of the study area. Abra Broki, has long been facing problems with discharge of water/standing water, which can serve as a breeding ground for water-borne diseases. Once local peoples get infected with waterborne

disease, they have the potential to spread the disease rapidly, affect large areas, and cause short-term disruption. The overall effect is categorized as minor (Table 41). The implementation of recommended management measures would reduce the scale and keep disease localized and prevent disease from spreading. The overall impact then becomes negligible.

Table 41 - Significance of impact of construction on disease prevention

Social Impact:		Disease prevention				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	ST	LS	Low	Minor
Key mitigation measures/Recommendations:						
• Regular screening and treatment of workers						
• Raise awareness among workers about disease prevention with an information sharing strategy						
• Provide first aid health services through an on-site facility with an certified medical officer (nurse)						
• Establish a direct link with authorities to understand disease status of wider area						
• Provide access to nearby medical facilities, control programs and doctors						
• Eliminate standing water on site						
• Promote the use of repellents in the rainy season						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Medium	ST	SS	Low	Negligible

B. During Operation

Several positive and negative impacts are expected from construction of the buildings, which are discussed below.

6.2.10 Traffic and traffic related accidents

During operation, an estimated 800 persons are projected to work in the OTA buildings, of which an estimated 80% (640) will come with their own vehicle. Another 200-500 visitors are expected to come to the OTA office daily, and peak periods are usually during mid-month. Visitors will come both by bus and with their own vehicle. When coming by bus, these visitors will have to walk to the building on the Abattoirweg and this will create a mix of pedestrians, car traffic and heavy traffic, which posed a safety hazard.

The potential impact is for the long term because the traffic situation is not expected to change because the Van 't Hogerhuysstraat is already beyond its carrying capacity. The effect is expected to expand to all main roads in the area – until Poelelantje in the West, Latourweg in the South, Downtown in the North (outside the study area). The impact can be overall categorized as major (Table 42). The implementation of recommended management measures wouldn't reduce the

impact unless infrastructural measures are taken for road improvement (new roads and road structures).

Table 42 - Significance of traffic and traffic-related accidents during operation

Social Impact:		Traffic and traffic-related accidents during operation				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Medium	MT	LS	High	Major
Key mitigation measures/Recommendations:						
• Minimize pedestrian interaction with heavy traffic by construction of pedestrian walkways						
• Collaborate with authorities to improve signage, visibility and overall safety of roads (Road Improvement Plan)						
• Police regulation to regulate junctions of residential areas /main road						
With mitigation	Magnitude	Duration	Scale	Probability	Overall	
	Medium	MT	LS	High	Major	

6.2.11 Health effects from air emissions

Increase in particulate matter in the air due to release of fossil fuel emission is expected to have a moderate environmental impact, and after mitigation measures e.g. planting of green, a minor impact (see section on environmental impacts). The short-term health impact of air pollution on residents can cause respiratory and cardiovascular problems because heart and lungs must work harder to supply the body with oxygen. Also, irritation of the eyes, nose and throat, coughing, chest tightness and shortness of breath can be experienced. For the long term, peoples may suffer from i) accelerated aging of the lungs, ii) loss of lung capacity, iii) decreased lung function, iv) development of diseases such as asthma, bronchitis, emphysema, and possibly cancer, v) shortened life span and vi) decreased worker productivity⁷⁵.

If the traffic situation doesn't change, the impact of increased levels of air pollution on health may be moderate. Social management measures, such as monitoring and informing residents, may lead to better information and relationship management, but will not lower the impact. The impact can only be lowered with a decrease in emissions (Table 43).

⁷⁵ The Impact of Pollution on Worker Productivity. Graff Zivin, Joshua S.; Neidell, Matthew J. National Bureau of Economic Research, April 2011.

Table 43 - Significance of impact on incidence of respiratory disease

Social Impact:		Incidence of respiratory disease				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	MT	LS	Medium	Moderate
Key mitigation measures/Recommendations together with environmental mitigation measures:						
<ul style="list-style-type: none"> Monitor with national health agency incidence of respiratory diseases in area If needed, disseminate information sheets about respiratory disease identification and treatment in collaboration with health authorities 						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	MT	LS	Medium	Moderate

6.2.12 Parking

More than 800 peoples are expected to work at the new buildings and must reside on site between working hours varying between 7 AM to 4 PM. Some of these workers will take public transportation but the majority (an estimated 80%) will prefer taking their own car or moped to work. The building should provide parking for these employees, as well as the 200-500 public persons visiting the tax building for business. Currently, parking in the Nieuwe Haven is already problematic; finding a free spot is difficult and people double park or park on curbs. In the current situation, the impact of the new buildings on parking will be persistent over the coming years on the Nieuwe Haven. The overall effect is categorized as minor. The parking situation will only improve after infrastructural improvements for more parking space is made (Table 44).

Table 44 - Significance of impact on parking

Social Impact:		Parking				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Negative	Low	MT	MS	High	Minor
Key mitigation measures/Recommendations:						
<ul style="list-style-type: none"> Designate parking spaces to specific functions e.g. visitors, offices, industrial Create a good flow/one-way traffic to get to and from new building Put clear signage for parking at Nieuwe Haven 						
Study on Physical planning area						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		Low	MT	MS	Medium	Minor

6.2.13 Reachability of Tax Office

The tax office will move from the northeast side of town towards a more central location for both residents from both southwest and northeast Paramaribo. This central location is better reached by public transportation (32 bus routes pass the Van 't Hogerhuysstraat) than the old location where there are only a few bus routes. The new location may improve reachability of many peoples from Paramaribo south and west, as these are the direction in which Paramaribo is expanding. Better reachability was embraced by residents from Abra Broki and Beekhuizen. The positive impact reaches many peoples across Paramaribo, and will extend for at least the next decade. The overall impact is categorized as moderate (Table 45).

Table 45 - Significance of impact of reachability tax office

Social Impact:		Reachability of Tax Office				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Positive	Medium	MT	LS	High	Moderate
Key mitigation measures/Recommendations: Not Applicable						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		NA	NA	NA	NA	NA

6.2.14 Economic Effect

With more than 800 peoples working and visiting the new building daily, there are several spin-off effects that may occur in the area. Surrounding restaurants and canteens may offer/sell more food, and the pharmacy, banks and other service providers may get a greater amount of clients. The overall positive effect will reach peoples in Nieuwe Haven as well as the two residential areas, and will extend for the next 10 years. The overall impact is categorized as moderate (Table 46).

Table 46 - Significance of impact of economic effects

Social Impact:		Economic effects				
Without mitigation	Positive/Negative	Magnitude	Duration	Scale	Probability	Overall
	Positive	Medium	MT	LS	High	Moderate
Key mitigation measures/Recommendations: Not Applicable						
With mitigation		Magnitude	Duration	Scale	Probability	Overall
		NA	NA	NA	NA	NA

6.2.15 Gender Equality

During operations, there are no impacts expected because the existing staff of the Tax Office and Customs (Ministry of Finances) will move to the new location. Changes in composition of staff will not occur, given the fact that hiring and firing for Government functions is a long and tedious process.

7 Conclusions and Recommendations

This chapter presents the general conclusions that have been drawn from the ESIA process and which should be considered in evaluating the project.

The proposed project site is located at an area that has been used for several activities, such as naval base in the 1980's and nowadays there are few small facilities that are being used by the Port Management Company for some administrative services. The Environmental Assessment was primarily based on available secondary data as no field tests were required, to identify and evaluate biophysical impacts of the OTA building project.

There are a number of minor or less significant environmental impacts associated with the construction of the OTA building. If recommended mitigation measures are adopted, these impacts are not expected to be significant nor long-term. They include groundwater, visual, air quality, noise and vibration, waste management and climate change impacts.

Relevant observations with regard to these impacts are:

- Impacts on surface water quality in the Suriname River are most likely the result of construction activities due to runoff of sediments or contaminated water from construction site. Impacts on water quality are expected to be limited due to the tidal nature of the river (resulting in vigorous mixing and dilution capacity), the expected small volume of pollutants and the absence of sensitive habitats in the area;
- Impacts on terrestrial and aquatic habitat quality are expected to be negligible as construction site is very small and located in highly disturbed area of no conservation value;
- The movement of construction vehicles and the transport of construction materials, equipment and workers to and from the work sites may affect road traffic. Due to the increase traffic, it is expected that the impacts on air quality and to climate change are of moderate effect during both the construction and operations (due to increased movement of people) phase. With the implementation of the mitigation measures, those impacts can be reduced to minor effects.
- The impact on soils as a result of small leaks and spills is considered of moderate effect during the construction phase. If the proposed mitigation measures are implemented, the impact will be reduced to negligible effect.
- Impacts from noise and vibrations due to pile driving activities are of major concern as it may

have moderate effects to the surrounding infrastructures. A detailed study on the geotechnical features of the project site is recommended in order to determine the proper pile driving techniques for that area to reduce as much as possible the impacts.

- Impacts from solid waste generation during the construction and operations phases may pose minor effects to the environment. It is recommended to have a comprehensive waste management plan in order to reduce the impacts from solid waste.

The area in direct vicinity to the proposed project site is characterized by commercial and industrial activities such as gas stations, bank, police station, and office buildings. Adjacent to the site is a port located which annually handles 90% of the imported goods on which Suriname's economy is dependent. The harbor houses the customs department as well as several port services, such as shipping, freight and transport companies. Only few medical facilities open to the public – pharmacy and clinic - are found near the proposed site.

All traffic from the industrial and residential areas needs to pass through the main road: Van 't Hogerhuysstraat. This street is one of the busiest streets in Paramaribo, with an estimated 40,000 cars and 32 bus routes passing daily. Some companies and individuals use the main street as a hub for picking up passengers for longer trips to interior/south. Of the six junctions and one roundabout that exist on the main road, only one junction is traffic light-regulated. This leads to heavy traffic congestion during peak hours which causes irritation with the surrounding residents and businesses. The main road records the highest combined number - 12,7% - of all traffic accidents in Paramaribo.

- Potential impacts during construction are caused by i) nuisance from excessive noise and flying dust from trucks and other moving vehicles and vibration from the pile driving for the construction of the building, ii) resettlement of the inhabitants of buildings that are currently located at the site, iii) occupational hazard, iv) violation of working hours and conditions, v) increase in communicable diseases. With adequate measures, all these potential impacts can be made negligible.
- During operation of the OTA buildings, the potential impact on traffic and traffic safety for surrounding businesses and residents comes from the extra 800+ peoples that must travel to work and park at the industrial complex. Traffic jams already occur and will worsen, with or without the OTA Building (plus 800 men), since there are already plans for expansion of the Port activities. Traffic safety of workers/employees, customers and

other road users may be compromised with the increase of heavy and light vehicles on the already exceeded capacity of the primary and secondary roads

- During operation of the OTA buildings, the traffic flow and traffic safety continues to have a moderate impact. Due to the limited traffic flow, emission release will become localized and this may cause moderate problems in respiratory disease for residents living in the surrounding area.
- Besides traffic, the influx of employees and visitors in the industrial area is expected to create more constraints in the already challenging parking situation; currently, visitors and employees double park or park on curbs because of the limited amount of parking spots. None of the impacts during operation can be reduced to negligible with the proposed management measures. Because traffic flow, traffic safety and parking will remain a serious issue on the proposed OTA location, it is recommended to look for alternative locations to minimize the long-term social impacts.
- In case the decision is made to use the selected area, it is highly recommended that further in depth traffic studies are conducted, including traffic management plans prepared in order to assess whether the impact can be mitigated to an acceptable level. For these studies, all future expansion plans as well as other plans which might have an impact on the area must be taken into consideration.

Appendices

Appendix 1 - Overview of the relevant provisions of the Surinamese laws and regulation

Construction Phase			
	Law	Objective	Provisions which are relevant to the project
Air emissions	<p>STATE ORDER ON DRIVING</p> <p><i>(Rijbesluit)</i></p> <p>G.B. 1960 no. 105 last amended by S.B. 2005 no. 17</p>	Provide rules for safe driving	Article 31c: noise and environmental aspects: the exhaust pipe from vehicles must be sound proofing; the Minister can prescribe allowable noise standards and carbon monoxide standards for exhaust fumes;
	<p>Nuisance Act <i>(Hinderwet)</i></p> <p>(GB 1930, no. 64; GB 1944, no. 57; 1972, no. 96)</p>	To prevent the cause of danger, damage or hindrance caused by undertakings (enterprises) to the outside-fence surrounding environment	<p>Article 1: Art 1: It is prohibited to establish enterprises /undertakings, which can cause danger, damage or hindrance. A written 'Nuisance Permit' ('Hindervergunning') must be issued by the District Commissioner.</p> <p>Article 6: In case of outside-fence nuisance caused by air pollution and noise, soil and water pollution and generation of solid or liquid waste, the nuisance permit will be refused by the district commissioner.</p>
Traffic Nuisance			
Noise	<p>STATE ORDER ON DRIVING</p> <p><i>(Rijbesluit)</i></p> <p>G.B. 1960 no. 105 last amended by S.B. 2005 no. 17</p>	Provide rules for safe driving	Article 31c: noise and environmental aspects: the exhaust pipe from vehicles must be sound proofing; the Minister can prescribe allowable noise standards and carbon monoxide standards for exhaust fumes;
	<p>SAFETY REGULATION 7, WORK CONDITIONS</p> <p><i>(veiligheidsvoorschrift)</i></p>	To promote safe and comfortable working conditions relating to hazardous or disturbing noises	Article 21: machinery, tractors, plants or equipment shall be constructed, equipped or prepared or supported that they do not cause harmful or annoying noise or vibration when in operation, unless it is impossible or cannot be expected

	7) S.B. 1981 no. 72	and vibrations.	reasonably. Article 21: the performance of work shall be such that it does not cause harmful or annoying noise or other harmful or annoying vibrations, unless it is impossible or cannot reasonably be requested.
	NUISANCE ACT (<i>Hinderwet</i>) (GB 1930, no. 64; GB 1944, no. 57; 1972, no. 96)	To prevent the cause of danger, damage or hindrance caused by undertakings (enterprises) to the outside-fence surrounding environment	Article 1: Art 1: It is prohibited to establish enterprises /undertakings, which can cause danger, damage or hindrance. A written 'Nuisance Permit' ('Hindervergunning') must be issued by the District Commissioner. Article 6: In case of outside-fence nuisance caused by air pollution and noise, soil and water pollution and generation of solid or liquid waste, the nuisance permit will be refused by the district commissioner.
Water	BUILDING STATE ORDER (<i>Bouwbesluit</i>) G.B. 1956 no. 108	Provide further rules for construction	Article 4: construction shall only take place according to an approved construction plan by the director; Article 12: the request for a construction license should include the purpose of the construction, the area, drawing; Article 64: Each building must be equipped with well-mounted waterproof gutters to collect and discharge rainwater to a sewer or to public waters.
	POLICE CRIMINAL ACT (<i>Politiestrafwet</i>) G.B. 1915 no. 77 last amended by S.B. 1990 no. 24	Regulates public order	Article 51: pollution of water resources is penalized.
Solid waste	POLICE CRIMINAL ACT (<i>Politiestrafwet</i>)	Regulates public order	Article 39a: penalizes the disposal of waste on public places; Article 73: penalizes the disposal of car wreckages on public places; Article 51: pollution of water resources is penalized.

	G.B. 1915 no. 77 last amended by S.B. 1990 no. 24		
Waste water discharge	<p>BUILDING STATE ORDER</p> <p><i>(Bouwbesluit)</i></p> <p>G.B. 1956 no. 108</p>	Provide further rules for construction	<p>Article 4: construction shall only take place according to an approved construction plan by the director;</p> <p>Article 12: the request for a construction license should include the purpose of the construction, the area, drawing;</p> <p>Article 64: Each building must be equipped with well-mounted waterproof gutters to collect and discharge rainwater to a sewer or to public waters.</p>
	<p>PENAL CODE</p> <p><i>(Wetboek van Strafrecht)</i></p> <p>G.B. 1911 no.1 zlgbij SB 2004 no. 105</p>		<p>Article 224 and 225: Applying a substance in a well, pump, source, snaffle, or in a creek or a water resource that is being used as drinking water supply, which can harm human health is prohibited.</p>
	<p>POLICE CRIMINAL ACT</p> <p><i>(Politie Strafwet)</i></p> <p>G.B. 1915 no. 77, z.l.g. bij S.B. 1990 no. 24</p>		<p>Article 39: It is prohibited to throw waste on public roads, or adjacent footpaths or places accessible to public, or into a canal or creek destined for discharge.</p> <p>Article 51: It is prohibited to pollute a water reservoir, or canal used for drinking and washing purposes</p>
Drainage effluent management	<p>BUILDING STATE ORDER</p> <p><i>(Bouwbesluit)</i></p> <p>G.B. 1956 no. 108</p>	Provide further rules for construction	<p>Article 4: construction shall only take place according to a construction plan approved by the director;</p> <p>Article 12: the request for a construction license should include the purpose of the construction, the area, drawing;</p> <p>Article 64: Each building must be equipped with well-mounted waterproof gutters to collect and discharge rainwater to a sewer or to public waters.</p>
Waste management	POLICE CRIMINAL ACT	Regulates public order	Article 39a: penalizes the disposal of waste on public places;

	<p>(<i>Politiestrafwet</i>)</p> <p>G.B. 1915 no. 77 last amended by S.B. 1990 no. 24</p>		<p>Article 73: penalizes the disposal of car wreckages on public places;</p> <p>Article 51: pollution of water resources is penalized.</p>
Occupational Health			
Occupational Safety	<p>ACCIDENTS ACT (Ongevallenwet)</p> <p>G.B. 1947 no. 45 last amended bij S.B 2001 no. 66</p>		<p>Article 4: The employer is obliged to compensate the employee in the event of an accident during working hours</p> <p>Article 10: The employer is obliged to insure workers against accidents within the meaning of the Act.</p> <p>Article 24: a list of occupational diseases that are treated as accidents under this Act.</p>
	<p>SAFETY REGULATION #1 REGARDING THE PREVENTION AND LIMITATION OF ACCIDENTS</p> <p>(Veligheidsvoorschrift #1 voorschriften voor alle ondernemingen ten aanzien van het voorkomen en beperken van ongevallen.</p> <p>(G.B. 1972 no. 95)</p>	<p>To prevent and limit accidents at work</p>	<p>Article 13: Cranes and other lifting devices and all of its parts must be maintained in good condition to prevent accidents. When lifting loads the sudden drop should be prevented.</p> <p>Article 14: On cranes or other lifting devices, for loads over 1000 kg, the safe weight which can be carried must be written properly and may not be exceeded.</p> <p>Article 15: The cables and chains must not exceed their maximum force.</p> <p>Article 17: A lifting device, its accessories and devices must be suitably constructed, made of materials of good quality, be strong enough and must be in good order and condition.</p> <p>Article 18: A lifting device must be properly anchored and constructed. All cranes (including cables, chains etc.) must be inspected properly after they have been</p>

			<p>installed and anchored after each period of two months.</p> <p>Article 19: The person operating a crane (hoist) must be competent. A person younger than 18 years, may not work on cranes; he is not allowed to grease or operate the crane or give signals to the crane's operator.</p> <p>Article 20: The maximum allowable safe load of each hoist, trolley must be clearly visible declared on the implement or vehicle and must not be exceeded by the user.</p> <p>"Article 22: All measures must be taken into consideration when demolishing, renovating buildings to prevent collapsing and falling.</p> <p>Article 23: Good maintenance of floors, loading platforms, stairs and planks.</p> <p>Article 25:</p> <p>(1) Floors, landings, corridors, stairways and duckboards must be:</p> <p>a. constructed in such a way that no part of it bends;</p> <p>b. created and maintained so that the danger of tripping or slipping should be prevented as much as possible;</p> <p>c. kept free from objects which might block a passage.</p> <p>(2) In the case that floors, landings, corridors, stairways and jobs are at a height which exceeds 2.5 meter, each floor, landing and corridor:</p> <p>a. shall be provided with interlocking boards, except in the case that other effective measures are taken to ensure security;</p> <p>b. shall be wide enough;</p> <p>c. and every workplace and stairway be</p>
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			<p>suitably sheltered.</p> <p>(3) Stairs and ladders must comply, in particular, with the following:</p> <p>a. a stairway with a width over 1.20, must be provided on both sides with at least on one side with an efficient and robust handrail unless special circumstances prevent this, in which case a sturdy rope ladder should be fitted;</p> <p>b. if necessary, a step with a width over 2m, also in the middle of the width a sturdy handrail must be placed;</p> <p>c. a movable staircase shall be provided with such device that adequate security is provided against slipping when getting on and off;</p> <p>d. a ladder should extend at least 1 m above the spot which it gives entrance to for a safe step up or down to the ground;</p> <p>e. the rungs of a ladder or stairway shall not only be fastened by nails or screws;</p> <p>f. wood ladders shall not be painted or oiled or varnished.</p> <p>Article 26: Each opening in a floor must be provided to prevent persons falling into it.</p> <p>Article 27: All ladders must be secured against turning over.</p> <p>Article 28: Hoisting must be covered to prevent persons falling through openings in the joisting.</p> <p>Article 29: It is prohibited to work on a roof when there are uncovered openings in the joisting."</p> <p>Article 38 Stacking objects or substances, making grooves, shafts, tunnels, trenches, pits, wells and the absence or undermining of land should take place in compliance with and application of these precautions,</p>
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			<p>which give sufficient guarantees against the risk of sagging, falling, overturn or collapse.</p> <p>Article 39: Lashes, chains, straps, ropes, etc., where and in what manner whatsoever used, may not be taxed more heavily than permitted for safe use.</p> <p>Article 40: Workers should have the disposal of sufficient PPE and proper storage facilities for these PPE.</p> <p>The workers are obliged to use the PPE according to instructions. Employers are obliged to see to it that the workers are using the PPE.</p>
Fatigue	<p>SAFETY REGULATION # 7 WORKING CONDITIONS</p> <p>(Veiligheidsvoorschrift #7 Werkomstandigheden)</p> <p>S.B. 1982 no. 72</p>		<p>Article 28: Heavy physical labour which might have a negative impact on the worker must be prevented.</p> <p>Article 29: Measures should be taken to avoid adverse impacts for the worker's condition.</p> <p>Article 30: Seats and footplates for operating machines should be adapted to avoid extra load on the muscles and prevent fatigue.</p> <p>Article 31: Seats and footplates for working with machines, equipment, installation, appliances and vehicles should be adapted to the employees in order to avoid extra load on the muscles and prevent fatigue.</p>
Operational Phase			
	Law	Objective	Relevant articles
Air emissions	<p>STATE ORDER ON DRIVING</p> <p>(Rijbesluit)</p> <p>G.B. 1960 no. 105 last amended by S.B. 2005</p>	Provide rules for safe driving	<p>Article 31c: noise and environmental aspects: the exhaust pipe from vehicles must be sound proofing; the Minister can prescribe allowable noise standards and carbon monoxide standards for exhaust fumes;</p>

	no. 17		
	<p>NUISANCE ACT</p> <p><i>(Hinderwet)</i></p> <p>(GB 1930, no. 64; GB 1944, no. 57; 1972, no. 96)</p>	<p>To prevent the cause of danger, damage or hindrance caused by undertakings (enterprises) to the outside-fence surrounding environment</p>	<p>Article 1: Art 1: It is prohibited to establish enterprises /undertakings, which can cause danger, damage or hindrance. A written 'Nuisance Permit' ('Hindervergunning') must be issued by the District Commissioner.</p> <p>Article 6: In case of outside-fence nuisance caused by air pollution and noise, soil and water pollution and generation of solid or liquid waste, the nuisance permit will be refused by the district commissioner.</p>
	<p>SAFETY REGULATION NO.2, to promote cleanliness (S.B. 1972 no. 104).</p>	<p>Promotion of</p>	<p>Article 1: Buildings and affiliations must be kept clean and kept free of dust.</p>
Noise	<p>STATE ORDER ON DRIVING</p> <p><i>(Rijbesluit)</i></p> <p>G.B. 1960 no. 105 last amended by S.B. 2005 no. 17</p>	<p>Provide rules for safe driving</p>	<p>Article 31c: noise and environmental aspects: the exhaust pipe from vehicles must be sound proofing; the Minister can prescribe allowable noise standards and carbon monoxide standards for exhaust fumes;</p>
	<p>SAFETY REGULATION 7, WORK CONDITIONS</p> <p><i>(veiligheidsvoorschrift 7)</i></p> <p>S.B. 1981 no. 72</p>	<p>To promote safe and comfortable working conditions relating to hazardous or disturbing noises and vibrations.</p>	<p>Article 21: machinery, tractors, plants or equipment shall be constructed, equipped or prepared or supported that they do not cause harmful or annoying noise or vibration when in operation, unless it is impossible or cannot be expected reasonably.</p> <p>Article 21:the performance of work shall be such that it does not cause harmful or annoying noise or other harmful or annoying vibrations, unless it is impossible or cannot reasonably be requested.</p>
	<p>Nuisance Act</p> <p><i>(Hinderwet)</i></p> <p>(GB 1930, no. 64; GB 1944, no. 57; 1972, no. 96)</p>	<p>To prevent the cause of danger, damage or hindrance caused by undertakings (enterprises) to the outside-fence surrounding environment</p>	<p>Article 1: Art 1: It is prohibited to establish enterprises /undertakings, which can cause danger, damage or hindrance. A written 'Nuisance Permit' ('Hindervergunning') must be issued by the District Commissioner.</p> <p>Article 6: In case of outside-fence nuisance caused by air pollution and noise, soil and water pollution and generation of solid or liquid waste, the nuisance permit will be</p>

			refused by the district commissioner.
Water	<p>BUILDING STATE ORDER</p> <p><i>(Bouwbesluit)</i></p> <p>G.B. 1956 no. 108</p>	Provide further rules for construction	<ul style="list-style-type: none"> - Article 4: construction shall only take place according to an approved construction plan by the director; - Article 12: the request for a construction license should include the purpose of the construction, the area, drawing; - Article 64: Each building must be equipped with well-mounted waterproof gutters to collect and discharge rainwater to a sewer or to public waters.
	<p>POLICE CRIMINAL ACT</p> <p><i>(Politie strafwet)</i></p> <p>G.B. 1915 no. 77 last amended by S.B. 1990 no. 24</p>	Regulates public order	<ul style="list-style-type: none"> - Article 51: pollution of water resources is penalized.
Solid waste	<p>POLICE CRIMINAL ACT</p> <p><i>(Politie strafwet)</i></p> <p>G.B. 1915 no. 77 last amended by S.B. 1990 no. 24</p>	Regulates public order	<ul style="list-style-type: none"> - Article 39a: penalizes the disposal of waste on public places; - Article 73: penalizes the disposal of car wreckages on public places; - Article 51: pollution of water resources is penalized.
Waste water discharge	<p>BUILDING STATE ORDER</p> <p><i>(Bouwbesluit)</i></p> <p>G.B. 1956 no. 108</p>	Provide further rules for construction	<ul style="list-style-type: none"> - Article 4: construction shall only take place according to an approved construction plan by the director; - Article 12: the request for a construction license should include the purpose of the construction, the area, drawing; - Article 64: Each building must be equipped with well-mounted waterproof gutters to collect and discharge rainwater to a sewer or to public waters.
	<p>PENAL CODE</p> <p><i>(Wetboek van Strafrecht)</i></p>		Article 224 and 225: Applying a substance in a well, pump, source, snaffle, or in a creek or a water resource that is being used

	G.B. 1911 no.1 zlgbij SB 2004 no. 105		as drinking water supply, which can harm human health is prohibited.
	POLICE CRIMINAL ACT <i>(PolitieStrafwet)</i> G.B. 1915 no. 77, z.l.g. bij S.B. 1990 no. 24		Article 51: It is prohibited to pollute a water reservoir, or canal used for drinking and washing purposes
Drainage effluent management	BUILDING STATE ORDER <i>(Bouwbesluit)</i> G.B. 1956 no. 108	Provide further rules for construction	<ul style="list-style-type: none"> - Article 4: construction shall only take place according to an approved construction plan by the director; - Article 12: the request for a construction license should include the purpose of the construction, the area, drawing; - Article 64: Each building must be equipped with well-mounted waterproof gutters to collect and discharge rainwater to a sewer or to public waters.
Indoor air contamination	SAFETY REGULATION NO. no. 7 <i>(Veiligheidsvoorschrift no. 7: Besluit werkomstandigheden)</i> S.B. 1981 no. 72		<p>Article 13: Buildings and other structures must be designed and maintained that the workers are protected against adverse influences of the climate outside.</p> <p>Article 15: For the assessment of climate conditions in the place where work is performed, effective measuring instruments should be kept.</p> <p>Article 20: a work space must have sufficient discharge of polluted air and facilities for fresh air through natural ventilation (in the walls or ceiling) or with artificial ventilation (effective technological measures, such as fans).</p>
	STATE ORDER ON HARMFUL GASES AND FUMES <i>(Veiligheidsvoorschrift no. 9 Besluitschadelijkegassen)</i>		<p>Art.3: Workrooms, locker rooms, cafeterias should be kept free from harmful or unpleasant steams or gasses.</p> <p>Art.4 Harmful or unpleasant steams and gasses must be discharged in case they are</p>

	<p><i>en dampen)</i></p> <p>S.B. 1981 no. 74</p>		<p>released in workrooms. In case the discharge is not possible, the amount of workers in the room should be kept minimal.</p> <p>Art. 5 During discharge of harmful or unpleasant gases, fresh air should be pumped into the room with equipment that is not allowed to be inoperative.</p> <p>Art.6: When the nature of the company makes it impossible to discharge, the Minister will determine MAC (Maximum acceptable concentrations) for these gases and fumes</p> <p>Art.7: In case working in such a room or area can bring risks of intoxication, suffocation or poisoning it is required that first research is done if entrance can be done without taking a risk.</p> <p>Art.8: Sufficient precautionary measures should be taken to prevent intoxication, suffocation and poisoning. In case of danger, persons should be taken out of the workroom, without others needed to enter the room.</p> <p>Art. 8: In case of work is being carried out in a room where these gases and fumes are emitted, at least one person should be outside the danger zone guiding the workers through telephone or other means of communication.</p>
Energy use	NONE		
Emergency preparedness such as fire fighting	<p>SAFETY REGULATION 3 TO PROVIDE FIRST AID</p> <p><i>(Veiligheidsvoorschrift 3),</i></p> <p>G.B. 1948 no. 183</p>	Provide provisions for enterprises regarding first aid	<p>Article 1: an enterprise in which driving gears or implements are set in motion by power tools it is obliged to provide effective first-aid in case of accidents.</p> <p>Article 7: the first aid person must hold a certificate of competency issued by the Medical Inspector.</p>

	<p>Act regarding the liability of the employer in case of accidents or occupational disease of the employee and compensation (The Accident Regulation)</p> <p><i>Ongevalleneregelng</i></p> <p>G.B. 1947 no. 145 last amended by S.B. 2001 no. 66</p>	<p>Provide rules for the employer for compensation of accidents during work</p>	<p>Article 4: the employer must compensate for accidents from his worker, which happened in connection with their employment.</p> <p>Article 6: the indemnification in case of accidents exists of: - medical treatment and nursing including medicines, artificial appliances such as artificial arms, legs, funeral costs etc.</p> <p>Article 10: the employer is obliged to insure the risk arising for him from this law to a competent insurance company.</p>
	<p>Act on Fire brigade Suriname</p> <p><i>Wet Brandweer Suriname</i></p> <p>S.B. 1993 S.B 1996 no 16</p>	<p>Rules to prevent and monitor a fire.</p>	<p>Article 14: Everybody that discovers or suspects a fire or overheating is obliged to inform the Police immediately.</p> <p>It is prohibited to deliberately falsely notify a fire or overheating.</p> <p>Article 15: It is prohibited to place objects or to have them in such a way that the use of means or provisions to notify a fire, is being hampered. It is prohibited to place objects or to have them in such a way that means and provisions to escape and to save persons and animals during a fire escape is being hampered.</p>



Appendix 2 - Primary and Secondary Stakeholders

Name	Representative	Address	Email	Phone
Primary stakeholders (to be consulted)				
Sol Suriname	Mark Goede, Director	Abbatoirweg	info.suriname@solpetroleum.com	(597) 482-027
Gow2	Aubrey Nai Chung Tong, Director	Van 't Hogerhuysstraat 27	info@gow2.com , aubreyng@yahoo.com	403-111
Khazana		Van 't Hogerhuysstraat 13	info@khazana-suriname.com	597402258
NV Havenbeheer	Andreas Talea, Director	Havenlaan zuid 5	info@havenbeheer.sr	+597 404044 / 404068 / 403625 / 404641
SUDA (houtbedrijf)	Dhr Tjon A Loi via hr Robin Brahira	Abbatoirstraat		
Matraxx	Robert Geer	Abbatoirweg 8	info@matraxx.net	8846244
RGM-Iamgold	Suresh Kalathil, Director	Van 't Hogerhuysstraat	info@iamgold.com	
CKC healthcare/CKC Medicare NV		Van 't Hogerhuysstraat	support.kerstenhealthcare@kersten.sr	401751
Apotheek Centra	Monique Gonesh	Havenlaan West 6A	centra.apotheek@gmail.com	402139/402143
Newmont	Albert Ramdin	Van 't Hogerhuysstraat	albert.ramdin@newmont.com	568760, 402892
VSH united	Patrick Healy, CEO	Van 't Hogerhuysstraat 9-	info@vshunited.com	597-402558
Politiebureau	Inder Janbahadoer			
DC Paramaribo Noord Oost	Regio Commandant Parinaribo	Van 't Hogerhuisstraat	inder211@hotmail.com	473080
DC Commewijne	Commissaris van Politie	15, 4th floor	kabinetrpc@gmail.com	473111
Ministerie OW	Dhr. Nerkust		secretariaat.dc.noordoost@gmail.com	322280
Civiltechnische Werken en wnd voor	Dhr. Adjaikoemar Kali		comcommewijne@live.com	
Bouwtechnische Werken				
Natte Civiltechnische Werken	Dhr. Soman		sosajo@yahoo.com	
Ministerie OW	Dhr. Mohan		satishvm2003@yahoo.com	
Wnd OD Ruimtelijke Ordening	Mw. L. Krishnadath		lkrisnadath2@gmail.com	
Hoofd afdeling Verkeer		rachelle_pierau@yahoo.com		
Wegenautoriteit	Dhr. Wip		henkwip@hotmail.com	
	Dhr. G. Nordon		geo.nordon@wegenautoriteit.sr	490040
Ministerie ATM	Dhr. John Courtar		cofu2000@yahoo.com	422250
Ministry of Finance	Iris Sandel		iris.sandel@finance.gov.sr	
Duane			iwan.wekker@financegov.sr	
Hoofd	Mr. Wekker		astrid.bouterse@financegov.sr	402626
SUNECON	Dhr. B. del Prado		delprado_brian@yahoo.com	8711378
Integra marine and freight services	Mr. Vijzelman, Director	Havenlaan-zuid POBox 18	integra@integramar.com	402392
Telesur	Mike Antonius, Acting Director	Havenlaan Zuid 1		473944/474242 tst 3999
Brandweer	Dhr. R. Jakhari			
	Commandant Brandweer		secretariaat@kbs.sr	463954
Secondary stakeholders (to be informed)				
Nationaal Vervoersbedrijf		Havenlaan West 2		401293 / (0)401298
				401836 / 477722
				tst.334,332,432,434,435 / 08865877
Hakrinbank	Mevr. Drs. S. Kisoensingh-Jhauw	Havenlaan Zuid	nwhaven@hakrinbank.com	402886 / 402080 toestel 1088/1089 Email 471555, 476270
Ministerie HI		Havenlaan 1	dhisur@yahoo.com	
RBC bank		Van 't Hogerhuysstraat		
Noodmarkt		Bolletriststraat		
Al aziz medical center		Calcuttastraat		
Rijschool welcome		Calcuttastraat/Ijzerhartstraat		
Taxicentrale 1660		Kankantriestraat		1660
De Paarl		Kankantriestraat 2		403600
Zajofa (lustig events/events equipment rental)		Kankantriestraat 41		404914

Appendix 3 - Information Sheet to Stakeholders

Information Sheet Environmental and Social Impact Assessment Study Office of the Tax Administration

The Ministry of Finance, with support of the Inter American Development Bank (IADB), plans to construct two separate sections of new buildings for the Office of Tax Administration and the Customs. The Government has dedicated approximately 2.0 ha land for the construction of these buildings in the Harbor area. Once completed, approximately 800 people are expected to work in this building

	
<p>Front (above) and rear view (below) of the New Tax Building</p>	<p>Location of the New Tax Buildings</p>

According to the regulations of the National Institute for Environment and Development (NIMOS) and IADB, a study should be done to assess potential environmental and social impacts. A team composed of the following specialist will conduct the study during February-March 2017.

- Armand Moredjo, Environmental Specialist

- Nancy Del Prado, Policy and Legal Specialist
- Gwendolyn Smith, Social Specialist

The team expects that the potential risks and negative impacts for this operation are related to the stages of construction and operation of the new buildings.

During the **construction phase**, it is expected that negative impacts on the environment will come forward resulting from soil movement, vibration, impact on groundwater levels, production of solid waste and effluent and industrial health and safety of workers and atmospheric emissions, among others. These impacts will be mitigated through the implementation of the Surinamese regulation for the construction of buildings, regulations including concerning special measures to handling and use of building materials, and specific designs for this kind of construction, specifically for the installation and management of air circulation, handling of merchandise areas, proper installation of electricity and IT systems, evacuation, etc.).

Potential negative impacts are also present during the **operation phase** and are related to the generation and handling of waste management and safety issues regarding the handling of imported goods and the use of heavy machinery. Traffic flows are also expected to change.

The team has identified you as a stakeholder in this study. The team will be open to any comments and suggestions you may have and will include those in the study. For this we will provide you with contact information (see below). Once the study is completed, you will be invited for a presentation of the study results.

For comments, suggestions or more information, please contact the study team. Phone numbers:
..... Email:

Appendix 4 - : Survey instrument for residential areas

Survey questions IADB ESIA 2017- BEEKHUIZEN

Adres:.....

Datm/Tijdstip:.....

1. Algemene informatie over de respondent

1.a Gender

☐ Man ☐ Vrouw

1.b. Etnische groep

- ☐ Creool
- ☐ Hindoestaan
- ☐ Javaan
- ☐ Chinees
- ☐ Inheems
- ☐ Marron
- ☐ Gemengd

1.c. Leeftijd

- ☐ 0-14
- ☐ 15-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 64+

1.d. Type beroepsgroep

- ☐ Besluitvorming and Managers
- ☐ Professionals
- ☐ Technicians and Associate Professionals, and Armed Forces
- ☐ Administratie (clerc)
- ☐ Dienstverlening, winkelpersoneel

- ☐ Landbouw of visserij sector (skilled)
- ☐ Ambachtelijke of handelsgerelateerde arbeid
- ☐ Fabrik's en machine werkers
- ☐ Onderwijzer(es)
- ☐ Weet niet
- ☐ Geen antwoord

1.e. Hoogste type afgerond formeel onderwijs

- | | |
|----------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> KLO | <input type="checkbox"/> Anders, nl..... |
| <input type="checkbox"/> GLO/BO | <input type="checkbox"/> Geen onderwijs |
| <input type="checkbox"/> VOJ (MULO/LBO) | <input type="checkbox"/> Weet niet |
| <input type="checkbox"/> IMEAO/NATIN/AMTO | <input type="checkbox"/> Geen antwoord |
| <input type="checkbox"/> Pedagogisch (SPI/ACI/CPI) | |
| <input type="checkbox"/> VWO/HAVO | |
| <input type="checkbox"/> IOL | |
| <input type="checkbox"/> HBO | |
| <input type="checkbox"/> Universitair | |

1.f. Toegang tot water, electriciteit en telecommunicatie

- | | | |
|--------------------------------------------------|-----------------------------|------------------------------|
| Bent u aangesloten op het drinkwaternetwerk ? | <input type="checkbox"/> JA | <input type="checkbox"/> NEE |
| Bent u aangesloten op het electriciteitsnetwerk? | <input type="checkbox"/> JA | <input type="checkbox"/> NEE |
| Heeft u ADSL aansluiting? | <input type="checkbox"/> JA | <input type="checkbox"/> NEE |

1.g. Toegang tot gezondheidszorg

Maakt u gebruik van een polikliniek/gezondheidscentra (medical centre/medi-lab/healthcontrol) in deze buurt?

- ☐ Nee ☐ Ja, welke.....

2. Percepties van de respondent over de buurt: VEILIGHEID

2.a. Hoe veilig voelt u zich in deze buurt?

- ☐ Ik voel me veilig
- ☐ Ik voel me soms veilig, omdat.....
- ☐ Ik voel me niet veilig, omdat.....
- ☐ Weet niet
- ☐ Geen antwoord

2.b. Tijdens de bouwwerkzaamheden van het project zal er dagelijks een relatief grote groep bouwvakkers/arbeiders in dit gebied werken. Welke effecten zal dit met zich meebrengen met betrekking tot de veiligheid van uzelf en van uw buurt?

- ☐ Geen effecten
- ☐ Wel effecten, namelijk.....
-
- ☐ Weet niet
- ☐ Geen antwoord

2.c. Zijn er 1 of meerdere plaatsen in deze buurt die u vermijdt?

- ☐ Nee ☐ Soms, namelijk
wanneer.....
- ☐ Ja, namelijk.....omdat.....
- ☐ Weet niet
- ☐ Geen antwoord

2.d. Hoe vaak heeft u contact met uw burens of buurtbewoners?

- ☐ Elke dag
- ☐ Wekelijks
- ☐ Maandelijks
- ☐ Nauwelijks
- ☐ Geen contact
- ☐ Weet niet
- ☐ Geen antwoord

2. Percepties van de respondent over de buurt: buurtkennis

2.d. Kent u 1 of meer sociale organisaties in de buurt (buurtorganisaties/jongerenorganisatie of anders)?

- ☐ Ja, welke.....
- ☐ Nee
- ☐ Weet niet
- ☐ Geen antwoord

2.e. Maakt u gebruik van de winkels of andere zaken in de buurt?

☐ Nee

☐ Ja, nl ☐ Supermarkt ☐ Kledin ☐ Haar/Nagelsal ☐ Bouwmaterialen/technisc ☐ Financieel
☐ Slager ☐ Electroni ☐ Drugst ☐ Restauran ☐ Betaaloketten EBS/SWM/Telesur

☐ Weet niet

☐ Geen antwoord

3. Ervaring van de plek: mobiliteit

3.a. Maakt u gebruik van het openbaarvervoer in deze buurt?

☐ Nee, ik heb een (brom)fiets/auto/taxi/anders, nl.....

☐ Ja, ik gebruik de bus

☐ Weet niet

☐ Geen antwoord

3.b. Hoe ervaart u de verkeersdruk in deze buurt?

☐ Ik ervaar geen last ervan

☐ Af en toe storend

☐ Zeer storend

☐ Weet niet

☐ Geen antwoord

3.ervaring van de plek: emotionele binding

3.c. Zou u graag willen verhuizen naar een andere buurt?

☐ Nee

☐ Ja, omdat.....

.....

☐ Ik sta neutraal

☐ Weet niet

☐ Geen antwoord

3.d. Betekenis van de buurt voor de respondent

Kunt u uw buurt omschrijven in 5 woorden?

1.....

2.....

3.....

4.....

5.....

3.e. Hoe ervaart u de komst van project in dit gebied?

- ☐ Ik ervaar het als positief omdat
- ☐ Ik ervaar het zowel positief als negatief , omdat
- ☐ Ik ervaar het als negatief omdat
- ☐ Ik sta neutraal
- ☐ Weet niet
- ☐ Geen antwoord

Appendix 5 - List of Consulted Stakeholders

Organization	Representatives	Subject.
Ministry of Finance	Ms. Sandel Ms. Jaggan Ms. Setrowidjojo	<ul style="list-style-type: none"> Project description Landownership
Port Management Authority (N.V. Havenbeheer Suriname)	Mr. Talea Mr. Latour Mr. Mulier Mr. Karg	<ul style="list-style-type: none"> Ownership of the site Expansion Plans of the Port ISPS Certification of the Port Security
SUNECON	Mr. Del Prado	<ul style="list-style-type: none"> Design of Construction
Customs	Mr. Wekker Mr. Tamenga, Mr. Guillard Mr. Codrington	<ul style="list-style-type: none"> Site Safety Work hours Security
The Road Authority (Wegen Autoriteit)	Mr. Leeftang Mr. Firtoe Ms. Gauri	<ul style="list-style-type: none"> Responsibilities RA Public/Private Roads Road maintenance
Ministry of Public Works, Transport and Communication	Ms. Krishnadath Ms. Dewansing Mr. Wip Mr. Mohan	<ul style="list-style-type: none"> Construction/Building permit Allotment Physical Planning, Parking, Zoning Traffic
Ministry of Labour	Mr. Courtar	<ul style="list-style-type: none"> Occupational Health and Safety Permits Waste
GOW2	Mr. Cheuk A Lam Ms. Dinai	<ul style="list-style-type: none"> Traffic Oil storage Tanks/Depots Security EHS risks
SOL	Ms. Tikai	<ul style="list-style-type: none"> Traffic Oil Storage Tanks/ Depots Security EHS Risks
Districts Commissioner Paramaribo North East	Mr. Nerkust	<ul style="list-style-type: none"> Nuisance Alternative areas
Police Station Nieuwe Haven	Inspector Toekoen	<ul style="list-style-type: none"> Traffic Safety/Accidents Traffic flow Nieuwe Haven/Van t

	Inspector Sewgobind Brigadier Hoogdorp	Hogerhuysstraat <ul style="list-style-type: none">▪ Nuisance▪ Security
Fire Department	Mr. Ho A Sjoë	<ul style="list-style-type: none">▪ Fire prevention and safety▪ Pre- Advice in design phase
VSH Holding	Mr. Poort	<ul style="list-style-type: none">▪ Nuisance▪ Port activities▪ Parking▪ Traffic
Pharmacy Centra	Ms. Gonesh- Hahn	<ul style="list-style-type: none">▪ Security▪ Port activities▪ Social impacts

Appendix 6 – List of stakeholders present at Stakeholders meeting

#	Naam	Organisatie	E-mailadres	Telefoonnummer(s)	Paraaf
1	Dinaï Monique	GOw2	mdinaï@gow2.com	8535573	
2	M. CHENK ALMON	GOw2	MCHENKALMON@GOW2	883-1048	
3	Kamden J	N.V.B	jeinermul@kamael.nl	8880022	
4	Augustus van N.	NVB	gustavij@hetmail.com	8545764	
5	Luischer G	Integra Maria	luischer@integra.nl	8615073	
6	LATOUR L.	H.B.S.	lummy106@hotmail.com	8575671	
7	Aman V.	H.B.S.	vanessa.aman@haventheer.nl	862266	
8	Wolf P.	RVC HBS		883-2382	
9	Foen H Foen H	VSH	info@H.Foen@vstunited.com	860293	
10	die Waktling E	UHL	info@vstunited.com	402870	
11	M.DANE-ALHOENADI	NIMOS	mdane@nimos.org	490044	
12	Delmelo B	Sunecan	delmelo-brunoyche	08711378	
13	CLEONISE E	DOUGRE	CLEONISE42@gmail.com	08912314	
14	J. Courteux	Arbeidsinspectie	john.courteux@atm.gov.nl	08611101	
15	J. Kishen Singh	Hedvinkbank	sharda.kishensingh @hedvinkbank.com	8552162	
16	Campagne E.	MinFin/PFC	ejcampagne@gmail.com	476044 85283	
17	Karimov M.	MinFin/RT	marus.karimov@rt.mhi.gov.nl	401818 1045	
18	Geffrie N.	" "	carverna.geffrie@nibni.gov.nl	402010 1105	
19	Fietse K.	Wegensanctific	sanjayfietse@hotmail.com	8645403	
20	Pley J. L.	Wegensanctific	lloyd.pley@wegensanctific.nl	8603342	
21	Wep H.	Min Olfen C	henkwp@hotmail.com	8675833	
22	Micha Vonk	Hedvinkbank	micha.vonk@hedvinkbank.nl	8675833	
23	Schmidjigja, P	Min Fin	paetrol@gmail.com	471108	
24	Iris Sandel	Min. Fin			
25	Joan Veldhuizen	Min. Fin			

Appendix 7 – Minutes of stakeholders meeting

Monday march 27th 2017 – ESIA stakeholder meeting OTA project

#	Category	Issue	Stakeholder	Comments	Response
1.	Health	Risk on the quality of drinking water, air Health of employees of the Tax Office	Min van Fin (PFC)- Mrs. E. Campagne	Will the project have an impact on drinking water and health issues for people who work in the neighborhood?	The study was limited to desk research. No measurements were done in the field with regards to the current water quality. There are currently no issues with SWM water that is being used. Furthermore, there were no complaints with regards to health issues in the neighborhood.
2	Health & safety	Risk of diseases (vaccination) with influx of workforce Inhalation of Hazardous substances together with traffic safety issues	VSH United-Mr. M. Foen A Foe	Are these issues considered? Have alternative locations also been studied?	The Health issues are considered in the Study. Other locations were not part of the study.
3	Property-location construction method	Real estate study There are only a few buildings on such valuable estate.	Sunecon- Mr. B.Del Prado	Customs is the authority that should be at the Port. That was the initial idea. In a later stage, the idea came up to add the Office of the Tax Administration.	The Port is certified. When the Port's safety is compromised, its certification is also in jeopardy. We recommend to facilitate the Customs Office at the port and accommodate the Tax Office elsewhere.

				<p>The area will be difficult to access.</p> <p>The area is ideal for offices; no low-rise buildings should be set up here.</p> <p>With regards to the foundation, the decisive layer is very deep. A lot of piles will be rammed into the ground.</p> <p>Because of the urgency of the project, a quick building method is needed, with assembly of prefab materials. Not many workers will be needed because of this method.</p> <p>5 other locations were identified</p>	
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4	Traffic/Transport Health grievances	Grievances of residents	Ministry of Labour- Mr. J. Courtar	<p>It is recommended to tackle the issue with regards to traffic and Parking with the introduction of Shuttle busses to transport personnel and clients.</p> <p>The Ministry of Labour should be contacted in an early stage, with regards to the permit request with pre-conditions. There should also be a good communication with the Ministry.</p> <p>It is recommended that for the construction phase, the transport of equipment and building materials should take place in the evening, or through the river</p> <p>Is the ESIA Report available?</p> <p>It is a suggestion to set up a Helicopter platform for emergencies on the port.</p>	<p>A study has to be performed with regards to traffic.</p> <p>Serious issues: stoplights, difficult corners.</p> <p>In the ESIA report permits have been included. With regards to labor contractors, one of the requirements will be that the sub-contractors should be tested.</p> <p>All the stakeholders will be informed when and where the final report is available.</p>
			SUNECON – Mr. B.	The coast guard was also included in one of the	

			Del Prado	<p>designs. This could also be used for transport of injured workers, etc.</p> <p>There were plans to solve the traffic problems by a road that should end at the Saramacca Canal.</p>	
			<p>VSH – mr. M. Foen A Foe</p> <p>SUNECON – mr. B. Del Prado</p>	<p>Is this the only location that has been identified?</p> <p>5 locations were recommended such as the old Post Office.</p>	DC North East have identified three locations as alternative. It's up to the government to indicate which location they prefer.
5	Destination plans		Nv.V. Havenbeheer – Mrs. V. Aman	<p>Have other activities at the Port also been taken into consideration?</p>	<p>Resettlement has also financial effects. Workers will also be relocated.</p> <p>The consultants have received a map with the destination plans of N.V. Havenbeheer. Abattoirweg is a private road and also the Havenlaan which leads to the Ministry of Trade and Industry. Exporters of wood already have permission for storage and transport of wood. A part of N.V. Havenbeheer has been reserved as a</p>

					<p>free-zone for semi-finished products for export. The third terminal of the port is planned behind Bridgeview. There are also oil offshore activities planned for which a specific area has been set aside for storage of all project piping's and equipment. Within this project, the activities should also take into account the plans of N.V. Havenbeheer. SOL doesn't have plans for expansions.</p> <p>According to IADB standards</p> <p>Resettlement is considered a red flag in ESIA</p> <p>The map with the destination plans from NV Havenbeheer is shown to visualize the expansion plans.</p>
6	Service hours	Extension of Opening hours of the Hakrin Bank	Hakrinbank – mrs. S. Kisoensingh	<p>Have the stakeholders been asked if the bank should extend their opening hours.</p> <p>With the influx of more people in the area, it will be an option for the Bank to extend the</p>	<p>The surrounding neighborhood has indicated that they make use of the services of the Bank frequently. It is recommended that the bank does its own survey in this regard.</p>

			<p>Ministry of Labour – mr. J. Courtar</p>	<p>services and opening hours.</p> <p>Extending the opening hours means requesting a permit for this.</p> <p>It is recommended to include a mechanism for grievances redress. It is important to have coordinated consultations during the construction phase (for decision-making)</p>	<p>A grievance box should be put in place and will be visible in the project.</p>
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Appendix 8 – Extension plan of the Port Management Company





Environmental and Social Management and Monitoring Plan for the Construction and Operation of the Office of Tax Administration Building

Final ESMP

Prepared for the Inter-American Development Bank

By

Nancy del Prado LLM (Environmental Law and Policy Specialist)
Armand Moredjo MSc (Environmental Scientist)
Gwendolyn Smith PhD (Specialist Environment/Conflict Resolution)

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April 24, 2017

1 Introduction

The primary purpose of this Environmental and Social Management Plan (ESMP) is to ensure that the mitigation measures recommended in the ESIA Report for the Construction and Operation of the Office of Tax Administration Building are effectively implemented and that any unforeseen or unidentified impacts of the construction and operations of the OTA Building Project are detected and addressed. The ESMP is also designed with the long-term aims of:

- Encouraging and achieving the highest environmental and social performance and response from all employees and contractors;
- Ensuring that management efforts are proactive and focused to prevent impacts from occurring; and
- Supplementing the proactive approach with reactive measures to minimize the severity or significance of any impacts that cannot be prevented at source.

By formally documenting environmental and social management measures and commitments, the ESMP serves a vital role in ensuring that potential negative impacts are minimised and positive impacts maximized. The ESMP, therefore, is a tool that guides the management and monitoring of impacts. In the event that impacts are found to be higher than initially predicted in the ESIA, additional mitigation measures will need to be implemented to control, reduce or prevent an impact from occurring.

The mitigation measures for the environmental and social risks which are discussed and assessed in the ESIA report is presented in Table A for Environmental Mitigation Measures and Table B for Recommendations regarding Social Issues.

Table A - Environmental Monitoring and Management Plan

No.	Management Aspect	Mitigation Measures	Responsible Person	Monitoring and Performance Evaluation		
				Performance Indicators	Monitoring Methods	Monitoring Frequency
Construction Phase						
C.1	Soil quality management	Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures.	Constructor contractor	Pre-Maintenance record	Visual inspection of vehicles, machinery and refueling/maintenance areas	Weekly
		Use spill prevention measures such as drip trays during refueling, bunds around storage tanks, etc. to capture spills and contain any leaks.		Number of leaks and spills		
		Clean up any spills (including existing spills) immediately, through containment and removal of free product and appropriate rehabilitation or disposal of contaminated soils.				
		Ensure all on site staff are trained in the use of spill prevention measures		Training record	Quarterly report	Quarterly
C.2	Groundwater quality management	Use drainage canal to receive discharge from dewatering		Maintenance report of drainage canal	Field observations	Monthly
		Stormwater to be lead into the drainage canal				
		Ensure drainage canal to the Suriname River is well maintained and contain macrophytes to retain pollutants				

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Clean up any spills immediately, through containment and removal of contaminated soils		Number of leaks and spills	Field observations	Weekly
C.3	Soil management	Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks.	Construction contractor	Pre-Maintenance record		
		Use spill prevention measures such as drip trays during refueling, bunds around storage tanks, etc. to capture spills and contain any leaks.		Number of leaks and spills	Field observations	Weekly
		Clean up any spills (including existing spills) immediately, through containment and removal of free product and appropriate rehabilitation or disposal of contaminated soils.				
		Ensure all on site staff are trained in the use of spill prevention measures		Training record		
C.4	Landscape changes (visual impacts)	Create green areas and/or plant trees around the perimeter of the site to act as a visual screen between building complex and nearby visual receptors.	Construction contractor			
C.5	Impact on land use	Create green areas and/or plant trees around the perimeter of the site to act as a visual screen between building complex and nearby visual receptors. .	Construction contractor			

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

C.6	Reduction in air quality and impaired human health	Maintain all generators, vehicles, and other equipment in good working order to minimize exhaust fumes	Construction contractor	# of complaints	Field observations	Monthly
		Cover stockpiles of dry, loose material with netting or similar to avoid dust, especially during windy and dry conditions				
		Spray access roads with water during windy and dry conditions				
		Maintain speed limits for the access roads				
		Discuss with relevant authorities the possibilities for creating an alternative access				
C.7	Noise impacts	Maintain all equipment in proper working order to avoid excessive noise generation	Construction contractor	# of complaints	Field measurements	During activities that produce excessive noise
		If complaints regarding noise are received from residents, consider installing partial screening around the noisiest activities and/or mufflers on noisy equipment				
		Where possible, restrict working times during construction to between 7 am and 5 pm on weekdays. No pile driving activities in the weekends. Notify any nearby receptors if construction work is planned outside of those times				
C.8	Impact of increased	Movement of vehicles should be restricted to the proposed project site	Construction contractor	Maintenance report of drainage canal	Field observations	Monthly

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

	turbidity and sedimentation in the Suriname River during the construction phase	Maintain a drainage canal that capture all storm water from the project site before it enters the Suriname river. This will retain as much sediment as possible.				
		Good housekeeping practices (e.g. clean up any spills immediately)				
C.9	Contamination of the Suriname River through stormwater discharge	Maintain a drainage canal that capture all storm water from the project site before it enters the Suriname river. This will retain as much sediment as possible.	Construction contractor	Maintenance report of drainage canal	Field observations	Monthly
		Good housekeeping practices (e.g. clean up any spills immediately)				
C.10	Ground vibrations due to pile driving causing damage to surrounding infrastructure	Carry out detailed geomorphological study to obtain information regarding the soil layers	Construction contractor			
		Carry out soil strength measurements for better decision making on pile driving method and number of piles				
		Monitor ground vibrations during pile driving activities		Ground vibration intensity	Field measurements	Daily during pile driving activities
C.11	Impacts on climate change	Maintain all generators, vehicles, and other equipment in good working order to minimize exhaust fumes	Construction contractor	Energy and fuel use	Maintenance records of equipment/vehicles	Monthly
		Develop and implement energy use policy for the buildings in the operations phase				

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the CH Building Project						
C.12	Impacts from solid waste	Develop and prepare waste management plan for both construction and operations phase	Construction contractor	Quantity of waste	Maintain records of waste disposed of	Monthly
		Identify local waste handlers to encourage recycling or re-use of some waste types				
		Place separate waste collector for different types of waste at the project site				
		Adopt proper policy for purchasing product to reduce waste production (product stewardship)				
C13	Contamination of Suriname River and Groundwater due to wastewater	Use portable chemical toilets during the construction phase	Construction contractor	Housekeeping status	Field Inspections	Weekly
C14	Flooding risk	Place sheet piling curtain at the river bank	Construction contractor			
		Have pump system installed to pump out excessive water				
		Ensure that the level of foundation of the new buildings is at least 1.0 m above ground level.				
		Take into consideration the type of foundations to avoid stressing the building due to humidity or water runoff				
Operations Phase						
O.1	Groundwater quality management	Use drainage canal to receive discharge from dewatering	OTA Management	Maintenance report of drainage canal	Field observations	Monthly
		Storm water to be lead into the drainage canal				

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Ensure drainage canal to the Suriname River is well maintained and contain macrophytes to retain pollutants				
		Clean up any spills immediately, through containment and removal of contaminated soils		Number of leaks and spills	Field observations	Weekly
O.2	Noise impacts	If complaints regarding noise are received from residents, consider installing partial screening around the noisiest activities and/or mufflers on noisy equipment	OTA Management	# of complaints	Field measurements	During activities that produce excessive noise
O.3	Contamination of the Suriname River through stormwater discharge	Maintain a drainage canal that capture all storm water from the project site before it enters the Suriname river. This will retain as much sediment as possible.	OTA Management	Maintenance report of drainage canal	Field observations	Monthly
		Good housekeeping practices (e.g. clean up any spills immediately)				
O.4	Impacts on climate change	Maintain all generators, vehicles, and other equipment in good working order to minimized exhaust fumes	OTA Management	Energy and fuel use	Maintenance records of equipment/vehicles	Monthly
		Develop and implement energy use policy for the buildings in the operations phase				
O.5	Impacts from solid waste	Develop and prepare waste management plan for operations phase	OTA Management	Quantity of waste	Maintain records of waste disposed of	Monthly
		Identify local waste handlers to encourage recycling or re-use of some waste types				
		Place separate waste collector for different types of waste at the project site				

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Adopt proper policy for purchasing product to reduce waste production (product stewardship)				
O.6	Contamination of Suriname River and Groundwater due to wastewater	Canteens to be provided with grease traps to retain as much grease as possible	Building complex management	Grease trap maintenance schedule	Field inspection	Quarterly
		Toilet waters to be flushed into septic tanks prior discharge to the environment during operations phase				
		Desludging of septic tanks to be done every two years		Desludging schedule	Tank maintenance record	Biennial (Every two years)
				Tank Inspection schedule	Tank Inspections	Yearly
		Carry out monthly monitoring of water quality (surface and groundwater for pH, Dissolved Oxygen, Redox, Conductivity, Escherichia coli and Total coliforms)		No non-compliance to WHO and/or IFC Standards	Water quality monitoring records	Monthly
O.7	Flood risk	Maintain drainage always clean	Building complex management	Drainage channel maintenance schedule	Field inspections	Monthly
		Prepare a flood response plan for monitoring and responding to emergency conditions arising from high water levels on the Suriname River				

Table B - Social Monitoring and Management Plan

No.	Management Aspect	Recommendations	Responsible Person	Monitoring and Performance Evaluation		
				Performance Indicators	Monitoring Methods	Monitoring Frequency
Construction Phase						
C.1	Demolition and Resettlement	Establish and maintain open communication and transparency with current inhabitants of buildings	Architect /Contractor	Communication report		Pre-construction phase
		Develop a demolition plan, including communicable diseases, health and safety of workers, nuisance from dust and noise				
		Negotiate a resettlement plan with affected stakeholders according to the national laws, including budget and schedule. Plan should present adequate replacement regarding accessibility, safety, size and quality of life				
		Monitor and evaluate the implementation of the demolition and resettlement plans		Percentage of implementation	Field observations, progress report	
C.2	Labor and working conditions	Raise workers’ awareness about labor rights with a short mandatory video	Project Management/ Contractor/ Ministry of Labor	Percentage of workers who watched video	Employment records	Quarterly
		Post posters explaining workers’ rights on strategic locations on site		Visual observations		
		Project management should plan and monitor over-work hours		Overwork policy	Employment records	
		Establishment of grievance redress mechanism		Number of complaints	Database on grievance	

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Workers, contractors and subcontractors are hired based on the existing labor rights policies		Hiring policy	Employment records	
C.3	Gender equality	Raise workers' awareness about gender equality with a short mandatory video	Construction contractor	Percentage of workers who watched video	Employment records	Quarterly
		Post posters explaining women's rights on strategic locations on site		Visual observations		
		Prepare and implement a harassment and violence policy		Number of violations	Employment records	
		Appoint a women handling women issues incl. gender equality		Appointment	Employment records	
		Have a gender-sensitive hiring policy		Number of hired men and women	Employment records	
		Ensure hygienic facilities on site		Visual observations		
C.4	Occupational health & safety	Promote use of Personal Protective Equipment (PPE) on site: safety glasses, plastic helmets, ear plugs, safety shoes, and gloves	Contractor	Number of accidents	Safety records	Monthly
		Show instruction video how to use PPE				
		Keep clear traffic ways on site and speed limits				
		Keep designated areas for material handling				
		Implement general Health and Safety Plan				
		Give training for workers to handle risks associated with heights confined spaces, hot work and mechanical lifting of load		Training record		
		Promote use of fall protection devices, such as rails or other barriers able to support a weight of 200 pounds		Number of accidents	Safety records	Monthly

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Develop fire prevention plan for hot work and other fire hazards				
		Selection of tools and workstations that reduce force requirements and holding times				
		Implement administrative controls into work processes, such as job rotations and rest or stretch breaks				
		Require licenses and work permits for hazard-prone tasks		Licenses		
C.5	Nuisance	Instruct workers to wear protective equipment - ear plugs, eye goggles		Percentage of workers who received instructions	Employment record	Quarterly
		Post warning signs in areas of high noise and dust levels instructing workers to wear protective equipment	Contractor	Visual observations		
		In the dry season, spraying against dust release will be promoted				
		Develop and implement a Health and Safety education program for workers		Program outcome	Program report	Quarterly
		Install a siren for announcement of excessive vibration when diving poles		Hearing		
		Disseminate a pamphlet to surrounding communities to inform them about times/dates of nuisance		Communication report		
C.6	Community Health & Safety : traffic and traffic- related accidents	Minimize pedestrian interaction with construction and supply vehicles by construction of pedestrian walkways		Number of road accidents	Road safety records	Monthly

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Collaborate with authorities to improve signage, visibility and overall safety of roads (Road Improvement Plan)	Ministry of Public Works/Police /Contractor			
		Educate workers and local communities about the changing situation during construction with a flyer				
		Dedicate persons to warn road users about changing conditions with signs				
		Have medical officer on site to provide first aid services in case of injuries on site		Number of first-aid accidents	Health report	Monthly
		Coordinate with the nearest emergency room (Academic Hospital) to provide services in case of accidents on site, and with helicopter ambulance services				
		Police regulation to regulate crossing of residential areas /main road		Visual observation		
		Conduct a study on traffic flow and safety				
C.7	Disruption of activities in the area	Inform surrounding businesses weekly about planned activities for the next week and expected disruptions	Contractor	Communication report	Emails, letters	Monthly
		Collaborate with surrounding businesses to find solutions to problems that may arise from disruption				
C.8	Security & Crime	Coordinate with local police (Nieuwe Haven) to understand neighborhood crime/social behavior patterns	Contractor	Communication report		Quarterly
		Fence construction site and appoint manned security to control gates		Visual observation		

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

		Monitor crime and unwanted social behavior		Number of crime-related incidents	Crime report	Monthly
C.9	Disease prevention	Regular screening and treatment of workers	Contractor	Number of sick persons	Health records	Monthly
		Raise awareness among workers about disease prevention with an information sharing strategy				
		Provide first aid health services through an on-site facility with an certified medical officer (nurse				
		Establish a direct link with authorities to understand disease status of wider area				
		Provide access to nearby medical facilities, control programs and doctors				
		Eliminate standing water on site		Visual observation		
		Promote the use of repellents in the rainy season		Health program	Health report	Rainy season
Operational phase						
O.1	Traffic and traffic-related accidents	Minimize pedestrian interaction with heavy traffic by construction of pedestrian walkways	Ministry of Public Works	Number of road accidents	Road safety records	Monthly
		Collaborate with authorities to improve signage, visibility and overall safety of roads (Road Improvement Plan)				
		Police regulation to regulate junctions of residential areas /main road	Police	Visual observation		
O.2		Monitor with national health agency incidence of respiratory diseases in area	Ministry of Health	Number of incidents		Monthly

Environmental and Social Management and Monitoring Plan for the Construction and Operation of the OTA Building Project

	Health effects from air emissions: respiratory diseases	If needed, disseminate information sheets about respiratory disease identification and treatment in collaboration with health authorities			Database/ Communication mechanisms	
O.3	Parking	Designate parking spaces to specific functions e.g. visitors, offices, industrial	Architect	Visual observation		
		Create a good flow/one-way traffic to get to and from new building				
		Put clear signage for parking at Nieuwe Haven	Ministry of Public Works			
		Study on Physical planning area				

2 Grievance Redress Mechanism

During construction, workers are expected to work in a high-energy environment: many different activities are ongoing in a small space with many workers. Grievances can be expected from this setting. Grievances can also come from violation of working conditions and hours, as well as unexpected change in environmental or social conditions on site. All grievances will be handled by an appointed Project Management Unit (PMU)¹ in a 5-day process, as follows:

1. Uptake of grievance and registration in database (1 day)

The PMU is responsible for grievance uptake submitted in several ways: i) Grievances will be written and submitted to a grievance box put in a discrete location on site. The PMU opens the box for collecting grievances once a day, 2) by phone with a dedicated (toll free) phone number. The PMU keeps a database (Microsoft excel) of the grievances, solutions and monitoring data.

2. Research (2 days)

The PMU will research the grievance by reviewing documents (logbooks etc.) and hearing the complainant and other individuals related to the grievance. Research should be done as thorough as possible and following the highest ethical and labor standards.

3. Generate solution (1 day)

The PMU will rely on general conflict resolution techniques to propose a solution to the problem that was submitted. The solution should be sustainable: resolve the grievance for the duration of the project's life. Resource persons may become necessary in case the issue is subject specific- such as a legal issue or a technical (construction) issue.

4. Discussion of solution with complainant (1 day)

The PMU will discuss the solutions with the complainant. In case the complainant is discontented with the solution, an alternative solution might be sought. In some cases, the

¹ A project Management Unit is responsible for the day to day management of the project in terms of administrative, social, legal and technical aspects.

complainant can be emotional, and then a mediator might be needed to discuss the solution.

5. Implementation and monitoring of solution (ongoing)

The PMU needs to regularly check in with the complainant after the solution is implemented. Every time the PMU asks the complainant about how the solution is perceived, the PMU makes a short report and submits it into the database.

Each person working on the site should get instructions on how to submit a grievance (type of information necessary), and the process that will be followed. Instructions will be given in the instructional video for workers before they can work on site.