

1.0 PROJECT DESCRIPTION AND INFRASTRUCTURAL DEVELOPMENT PLAN

1.1 Project Background

The company, US Capital Energy Belize Ltd. (hereafter referred to as US Capital Energy) has obtained a concession from the Government of Belize to undertake oil exploration in Toledo and South Stann Creek District, Belize (see **Figure 1.1**). This company is one of a number of concessionaires now exploring for petroleum in Belize or, are in the process of preparing to do so. The country has been the focus of renewed petroleum prospecting interest since Belize Natural Energy (BNE) discovered oil in commercial quantities in western Belize in 2005. With the current high prices for hydrocarbon fuels on the international markets there is the feeling that the country should proceed to harvest its hydrocarbon resource to further national development goals.

The Government of Belize (GoB) has committed itself to a long term development model that emphasizes sustainable and rational use of the country's natural resources. All new projects are consequently evaluated against this criteria in the hope that needed development will be balanced against the need to protect and enhance the country's natural resources.

US Capital Energy, at the behest of the environmental community and under the guidance of the Department of the Environment, has identified the need for an environmental impact assessment study of their proposed development project. This study was undertaken between March and May, 2007 based on information available in the public domain at the time of writing.

1.2 Project Justification

Concession Block 19 extends from the Sarstoon River which forms the southern boundary with Guatemala to just north of Seine Bight Village and San Pablo. For the purposes of this environmental assessment the study area is limited to the area south of the Moho River and north of the Sarstoon River with the western boundary defined by protected areas to the northwest and the Guatemalan border to the west.

The concession area awarded to US Capital Energy has many of the same favorable characteristics as the nearby Reforma oil and gas fields of Mexico, which contain some of the largest oil reserves in the Western Hemisphere. These features include active oil seeps, giant sedimentation structures and thick reef-rock reservoirs. The company has processed and evaluated past seismic and drilling data using the latest technology and believe the area contains significant potential for hydrocarbon deposits.

The license area is immediately surrounded by surface oil seeps. At least five seeps are present in southernmost Belize. An active seep is located south of License A-7-96 and has been mined and burned for local purposes. Oil seeps are also present along fault zones on the crest of the Temash, River Bend and Sarstun structures. Geochemical analyses indicate that the oil has a Cretaceous origin and is chemically similar to the oil produced in the Reforma area of Mexico and in the Guatemalan Peten oil fields. Source rock studies indicate that the Lower Cretaceous source rocks that are the source of the Mexican and Guatemalan production are mature within the license areas.

Geologic and seismic studies conducted by Exxon (Esso) in the 1970s were encouraging and led to the wildcat drilling of a key well (Temash 1). Although signs of petroleum were discovered no commercial deposits were found. It is now believed that Exxon had problems interpreting the seismic data and resorted to wildcatting. New seismic processing techniques have helped to identify structures and traps that were not visible twenty years ago and have confirmed that the Temash 1 was drilled north of a major structure. Additionally, the removal of much of the rain forest by the Maya population for agriculture has uncovered important rock outcroppings. These outcroppings provide new information on the geological structures of the area and have helped to create a better understanding of the geological potential of the area. These openings have revealed more oil seeps and confirm that reef and reef talus rocks similar to those that contain the super giant reserves of Mexico are present in the Sarstoon Area where there are abundant oil seeps as well as giant anticlines comparable to nearby Mexico.

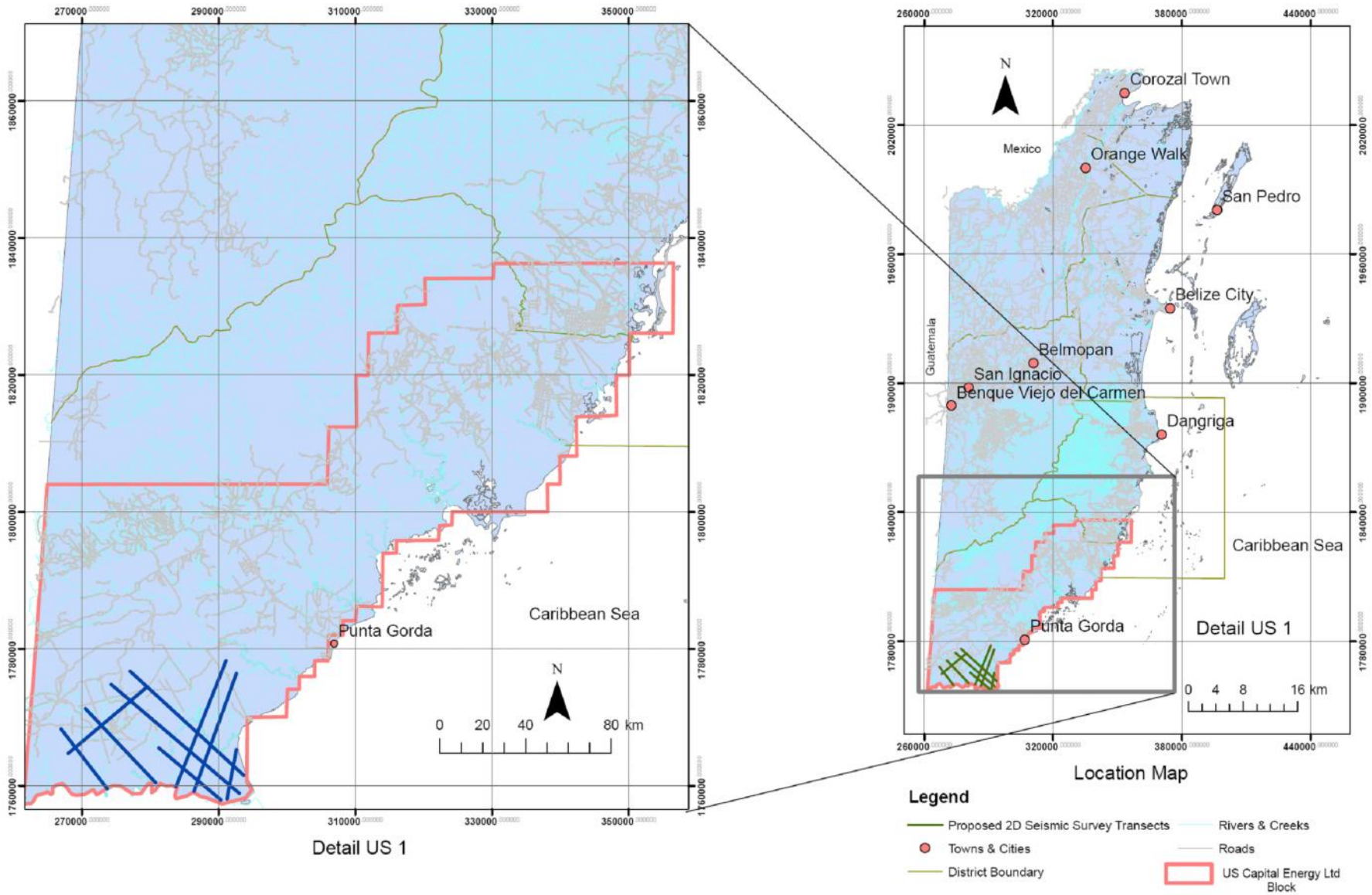


Figure 1.1: Project Location Map

The Esso seismic data has been reprocessed and interpreted on a Landmark SeisWorks workstation. Surface geologic mapping, magnetics, and satellite imagery have been integrated into the interpretation. Geochemistry has been conducted on surface oil saturations. The data indicates at least four closed structures as major oil traps involving Lower Cretaceous Rocks. The largest of these is approximately 30 km long and 14 km wide and has 300m of surface relief and could have more than 1,200m of subsurface closure. Similar production structures exist at nearby Las Casas (75km away), Chinaja and Rubelsanto Fields (150km away), however at those locations reserves are more limited because of the back reef setting.

In view of these encouraging signs, US Capital Energy has obtained the necessary licenses, contracts and permits including an eight (8) year exploration license and a 25 year exploitation and production agreement with the Government of Belize.

1.2.1 Previous Petroleum Exploration Attempts

Oil exploration within the project area or within its vicinity begun in 1959 when Phillips Petroleum Company drilled three exploration wells, one of which was bored near Punta Gorda in 1959, one near San Jose in 1963 and a well at Machaca, west of Punta Gorda in 1960. From this effort only the well near Punta Gorda yielded traces of oil with the others being dry holes, however the core samples confirmed the thick sequences of sedimentary rocks regarded by geologist as a necessary prerequisite to the formation of petroleum deposits.

Phillips Petroleum was followed in 1975 by Anschutz Corporation from Denver, Colorado. This company was given a license to carry out a comprehensive survey of the hydrocarbon and mineral potential of Belize. The area covered by the mineral survey included an area near San Pedro Savery a few kilometers to the west of the present day Sarstoon Temash National Park (STNP).

In 1977 Esso Ventures Ltd. carried out a seismic survey within the project area after geologists had observed oil seeps in debris flow conglomerates of early Tertiary age north of Crique Sarco. The company proceeded to drill the Temash -1 well near Crique Sarco. In this

well traces of oil were found throughout much of the early Tertiary to mid Cretaceous section that was drilled, however no commercial deposits were found.

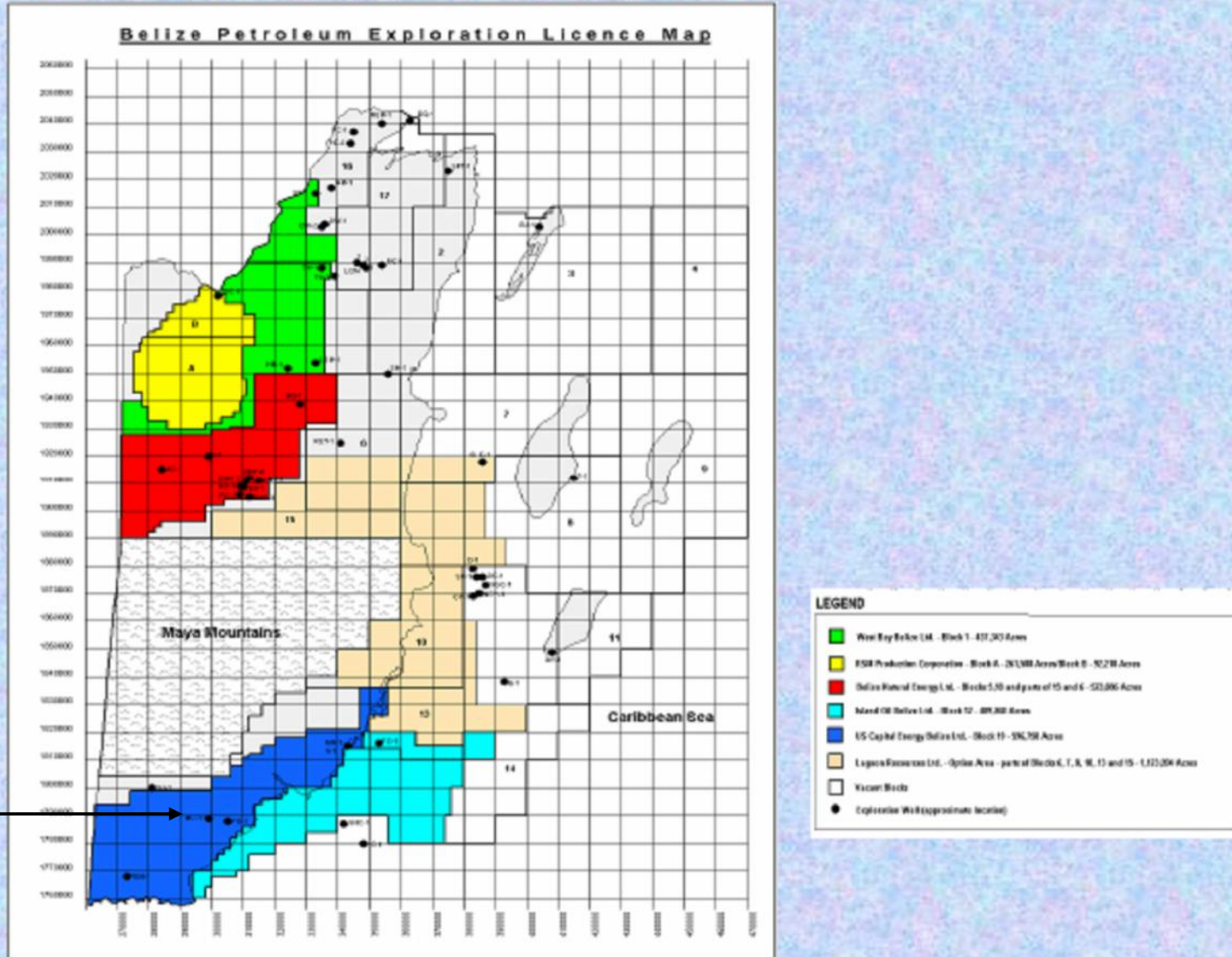
1.3 Project Location and Ownership

At the time of preparation of this ES, the Geology and Petroleum Department has divided the country into six (6) large concession blocks where the geological data suggest suitable subterranean structure for petroleum exploration exist. US Capital Energy Belize Ltd has had the concession for Block 19 since 2001. This concession covers an area of 322,250 ha (795,678 acres).

The concession area for exploration Block 19 runs from the Sarstoon River which forms the country's southern border with Guatemala in a northeasterly direction reaching north of Placencia and Independence Villages (**See Figure 1.2**). To the west the concession parallels the Guatemalan border up to the Colombia River Forest Reserve and runs along its southern boundary in an easterly direction taking in the Deep River Forest Reserve, Paynes Creek National Park, Mango Creek Forest Reserves 3 and 4, the Swasey Bladen Forest Reserve, Monkey Key Forest Reserve and the Sarstoon-Temash National Park (**see Figure 1.2**). In all, about 71 communities fall within the area covered by the concession.

US Capital Energy Belize Ltd is a privately owned company with offices in Corpus Christi, Texas and Littleton, Colorado. The company is duly incorporated under the laws of Belize with registered offices at #1 Front Street, Punta Gorda Town, Toledo District, Belize. The company signed a Production Sharing Agreement with the government of Belize on January 22nd 2001 which was later revised under a subsequent agreement on January 24th 2004.

PRESENT EXPLORATION MAP OF BELIZE



Petroleum
Exploration
Block 19

Figure 1.2: Petroleum Exploration Map of Belize as of May 2007.

1.4 Project Description and Plan

The project plan calls for an exploratory phase involving a series of seismic surveys on land to be followed by exploratory drilling if the results of the seismic survey warrants further investigation. Seismic surveying is an essential part of the whole cycle of petroleum exploration and production and is applied for regional mapping, prospect mapping, reservoir delineation, seismic modeling, direct hydrocarbon detection and the monitoring of petroleum production.

If the result of the seismic testing is favorable then the company will embark on a second phase in which drilling at predetermined locations informed from the seismic testing will take place. If drilling is successful and petroleum deposits are found, the company intends to embark on a third stage involving extraction, transport, storage and possible processing into refined products. This environmental statement addresses only the exploration phase.

1.4.1 Phases of Project Development

This portion of the project will be executed in a single phase:

1.4.1.1 Phase 1 – Exploration Phase

US Capital Energy intends to undertake petroleum exploration using a series of seismic tests for the purpose of acquiring seismic data. During Phase 1, a full menu of exploration-related activities will be carried out. The main focus of activity will center on the cutting of line transects which at present will be confined to the southern portion of the concession area. This activity was in progress when work was terminated following the court injunction on the project pending the production of an Environmental Impact Assessment (EIA). As a result of this, only short portions of some lines were completed while several others have not been started. The initial work schedule for the seismic study was to cover a period of approximately seven (7) months (between March 1 and September 31, 2006).

Figure 1.3 shows the location of the proposed line transects relative to the concession/project area. The figure shows that some lines will run in a northwest to southeast orientation while others will run in the direction opposite to this. The map shows that the main centers of

Figure 1.3: Location of cutlines relative to project area.

exploration will be between the Temash and Sarstoon Rivers and north of the Temash River. The village of Crique Sarco lies near the extreme western boundary of the cut lines while the Caribbean Sea defines the eastern boundary along the coast. The figure shows that there are nine (9) cut lines with five (5) running NW – SE and four (4) running NE to SW.

The lines will be cut to a width of ~ 1.5m along a straight line which should not deviate over the distance through which it travels. The initial agreement between the Government of Belize (GoB) and US Capital Energy required that the company leave standing all seed trees and secondary hardwoods. On the section of the trails already cut it was company policy to leave all trees greater than 7cm (3inches) Diameter Breast Height (dbh) standing and to lightly brush areas next to streams and other water bodies.

Following the clearing of the lines the company will commence seismic testing to determine the most likely areas for drilling. This activity will require that holes be drilled every 50m along the cut lines for the placement of sound charges called Geoprime made of Pentolite with a 1kg explosive load with biodegradable casing. Holes will be drilled using handheld portable drills driven by compressed air (see **Plate 1**) or motor down (depending on the location) to a depth of about 7m. and with a diameter of 7cm. The portable drills will be carried by work crews on foot along the lines, however, tractors may be used to achieve accesses near to the line although not in the park. Geophones placed in boats or in a truck will be placed to detect and record the sound waves for future analysis. Sound charges will not be placed next to rivers and streams and the company will avoid setting any charges near to residential homes. Charges will be set off using cables called detonators that will be long enough for them to be set off under safe conditions. Only 3 detonations of the Geoprime will happen at any one time. These will be repeated after approximately 10 minutes.

After the explosion, holes will be covered with the same materials extracted during drilling. Explosives that failed to detonate will be recovered and removed from the site for disposal at a suitable site outside the project area. Residual and chemical contamination of ground and surface water will be avoided by not setting charges within 100m of any major river and within 50m of any stream. Sensitive sites such as those of international conservation



Plate 1A: Typical view of portable drilling equipment.

importance will be avoided altogether. Other sensitive sites such as mangrove formations near to water bodies will be avoided.

The typical processes and mechanics involved in seismic testing are further described below.

1.4.1.2 The Conceptual Approach to Seismic Surveying

Seismic surveying is one of the three main geophysical methods used in petroleum exploration and is by far the most important method used in both the exploratory and developmental phases. It involves the use of acoustic or shock waves often referred to as primary P (push) waves.

When a wave discharged from the surface reaches a boundary between two media with different acoustic impedance (the product of density and velocity) it reflects some of the wave into the upper medium. Seismic surveying involves three main steps:

- Data Acquisition,
- Data processing,
- Interpretation

Data Acquisition - On Block 19 the energy source that will generate the sound waves will be provided by detonating explosives buried in shot holes. The returning acoustic waves will be recorded on geophones arranged in groups from where they will be transmitted along cables to the recording truck (vehicle). Equipment in this vehicle controls the firing of the energy source and records the incoming signals from the geophones on magnetic tapes.

Common depth points (CDP) coverage is widely used in which the shot points are gradually moved along a line of geophones allowing signals to be reflected at different angles for a common depth point.

Data Processing – After seismic data is collected it must be processed into a format suitable for geological interpretation. The data is interpreted by teams of seismic data processors including mathematicians, a geologist, a physicist, electronic engineers and computer programmers.

Four main steps are involved in processing of raw seismic data before the production of the raw seismic section. The steps are:

- Conversion of field magnetic tape data into a state suitable for processing,
- Analysis of data to select optimum processing parameters,
- Processing to remove multiple reflectors and enhance primary reflectors,
- Conversion of data from digital to analogue form and printout on a graphic display to show the final seismic line.

The process involves filtering out unwanted effects such as background noise emanating from sources other than the shot point.

Time or distance graphs are constructed based on the fact that the arrival time of the sound wave will increase with distance traveled (receiver from shot point). With common depth point shooting, reflections from the same subsurface points are recorded with a number of different combinations of surface source and receiver positions and the signals are combined or stacked.

The frequency and amplitude of the signal is the result of many variables, including the type of energy source used and its resultant wave amplitude, frequency and shape and the parameters of the various rocks through which the wave passes.

Interpretation of Seismic Data - There are several pitfalls that need to be avoided when interpreting seismic data. These include errors due to processing from:

- multiple reflectors,
- rapid local variations in formation velocity that can result from structures such as salt domes and reefs and
- those that result from the departure of rock geometry from a simple layered model.

During phase 1, maximum use will be made of the existing transport and communication infrastructure so as to create minimal environmental disturbances. Crews will travel by boat and busses along the main access roads and walk to the lines. Since all equipment is light and portable they will be transported by crew along the lines. Crew will enter and leave the work sites on a daily rhythm. During the seismic testing local accommodation will be rented for the seismic crew otherwise temporary accommodation will have to be provided.

1.5 Legal Framework for the Environmental Statement

The need to undertake environmental assessments is governed by Belizean law. This Environmental Statement (ES) is therefore issued in accordance with the directives of the Belize *Environmental Protection Act* of 1992 and the requirements of subsequent revisions and amendments. The main regulations, which should guide any future development at this site is the *Environmental Protection Act* of 1992 and the revisions to this act in 1995, 1996 and 1998. The Act requires an environmental assessment to be carried out, prior to a development consent being granted for certain types of major projects judged likely to have significant impacts on the environment.

Under the Belize Environmental Impact Assessment Regulations 1995 (SI No. 107 of 1995)², an environmental impact assessment (EIA) is mandatory for all aspects of the petroleum sector including oil exploration, oil production and oil refining. During the production of this ES, this law was amended and oil exploration projects now fall under Category II in which EIA's are not mandatory, however given the sensitive nature of the habitats and the existence of the Sarstoon Temash National Park (STNP) within the project area the instructions to prepare and present an ES was given to the developer.

At this stage the country of Belize does not produce guidance statements as to how different types of environmental assessments should be carried out and the methodology to be used for different aspects of the study. In this assessment best practice methods generally accepted locally and regionally have been used. This report follows the ToR developed for the scoping exercise carried out for this proposal and agreed by the developer and the DoE (See **Appendix A**).

1.6 Purpose of the Environmental Statement

An Environmental Impact Assessment (EIA) is the process of compiling, evaluating and presenting all the significant environmental effects of a proposed development. The assessment process is designed to help produce an environmentally sensitive scheme. This can be achieved by early detection of potentially significant adverse environmental impacts which can enable the scheme to be amended to avoid impacts, or allow appropriate mitigation measures to be built into the final design, construction methods and site practices.

The four principal objectives of this ES are as follows:

- To describe the proposal, the local environment and the existing conditions;
- To identify and evaluate the potential impacts of the proposal during the exploration phase;
- To propose mitigation measures and identify residual impacts, during the exploration phase;
- To communicate the results to decision makers and other interested parties.

1.7 Structure of the Environmental Statement

This Environmental Statement covering the exploration phase of the Block 19 concession comprises the following volumes and sections:

- Non Technical Summary – A brief report summarising the principal sections of the main document of the ES in non-technical language which should be readily understood by members of the general public. A copy is included at the beginning of this volume;
- A comprehensive and concise document drawing together all the relevant information about the scheme. The structure of the report is outlined below:

Section 1 – Project Description and Developmental Plans,

Section 2 - Information relating to the physical environment of the project site and area of influence,

Section 3 – Information on the legal and regulatory framework under which the company will operate and to which the developer must be observant,

Section 4 - Information relating to ecological features within the project area including species of conservation importance,

Section 5 – This section describes the water resources within the project area and establishes a baseline water quality value for these systems,

Section 6 - Provides information on liquid, solid and hazardous waste management issues liable to be applicable to the development of the concession and guidelines for their management,

Section 7 - Project energy requirements for the exploration phase1.

Section 8 - This section describes the geology and soils present in the area of the concession,

Section 9 – Issues related to transportation of equipment, personnel and extracted products are dealt with in this section,

Section 10 – This section deals with noise and vibration liable to be created as a result of project activity,

Section 11 – This section reports on the socioeconomic conditions of the project area and stakeholder’s perception of the proposed development,

Section 12 – Deals with the views of relevant NGOs,

Section 13– Archaeological features within the project area are discussed as well as potential impacts on these features,

Section 14 – This section deals with potential direct and indirect environmental impacts as a result of pursuing this project,

Section 15 – This section lays out the alternatives for development

Section 16 – This section lays out proposed mitigation measures and a monitoring plan.

- Appendices.

1.8 Environmental Assessment and General Methodology

The Environmental Assessment has been undertaken in accordance with best practice guidelines. Each impact assessment chapter in the ES is structured in the following way:

- Introduction
- Method of Assessment
- Baseline Conditions
- Predicted Impacts
- Mitigation

Each chapter sets out the basis of the assessment method adopted and gives an overview of the baseline conditions for each individual discipline, using various methods including literature research, desktop reviews of previous reports, satellite imagery and aerial photography, site visits/investigations and consultation exercises.

Impacts have been assessed and mitigation measures proposed for the exploration phase. Appropriate mitigation measures have been designed into the scheme for each of the relevant disciplines. These will ensure that environmental impacts are reduced to a minimum and that good environmental design has been adopted throughout. The general approach aims to optimise beneficial effects and avoid, reduce or remedy and compensate for new adverse effects.

1.9 Consultation

The EIA process calls for various levels of public consultation including meetings with key stakeholders and local community groups in order to get their views and opinions on the proposed project. These views have been incorporated into this ES (**See Chapter 11 and Appendix E**) and have helped in the development of the mitigation measures. The regulations require that a notice be published in a local newspaper advertising the availability of the ES for public perusal over a period of 2 weeks.

Wide ranging consultations have been carried out throughout the assessment process. In the initial stages of the assessment these consultations were carried out with community leaders, local conservation groups and other stakeholders. After the submission of the initial draft to the DoE further consultations were carried out on the community-wide level and copies of the ES were made available for public perusal at strategic locations throughout the project area.

1.10 Alternatives Considered

The company US Capital Energy has had a Production Sharing Agreement (PSA) with the Government of Belize since 2001. The agreement covers the full gamut of activities contemplated by the company and common to oil development companies generally including seismic testing and exploratory drilling, product extraction, as well as transportation, storage and export or local refining as well as data specific to the two parties.

If US Capital Energy would pursue the “Do Nothing” alternative it would violate the conditions and the spirit of the PSA with the GoB which required the company to conduct petroleum exploration work on the Block 19 concession area within a prescribed time frame.

The company must conduct 2D seismic testing and exploratory drilling on its concession area if it is to have any chance of discovering petroleum deposits. The company’s modus operandi in terms of its field operation in Block 19 will closely parallel other oil exploration efforts in Belize including the methods to be adopted to conduct the seismic testing, however the company’s policy is to adopt the most advanced technologies that will result in the least environmental impacts and leave the smallest footprint.

1.11 The Management Structure for the Proposed Development

Oil exploration and production operations are generally complex and involve a myriad of different responsibilities and required expertise to function properly. To ensure an adequate

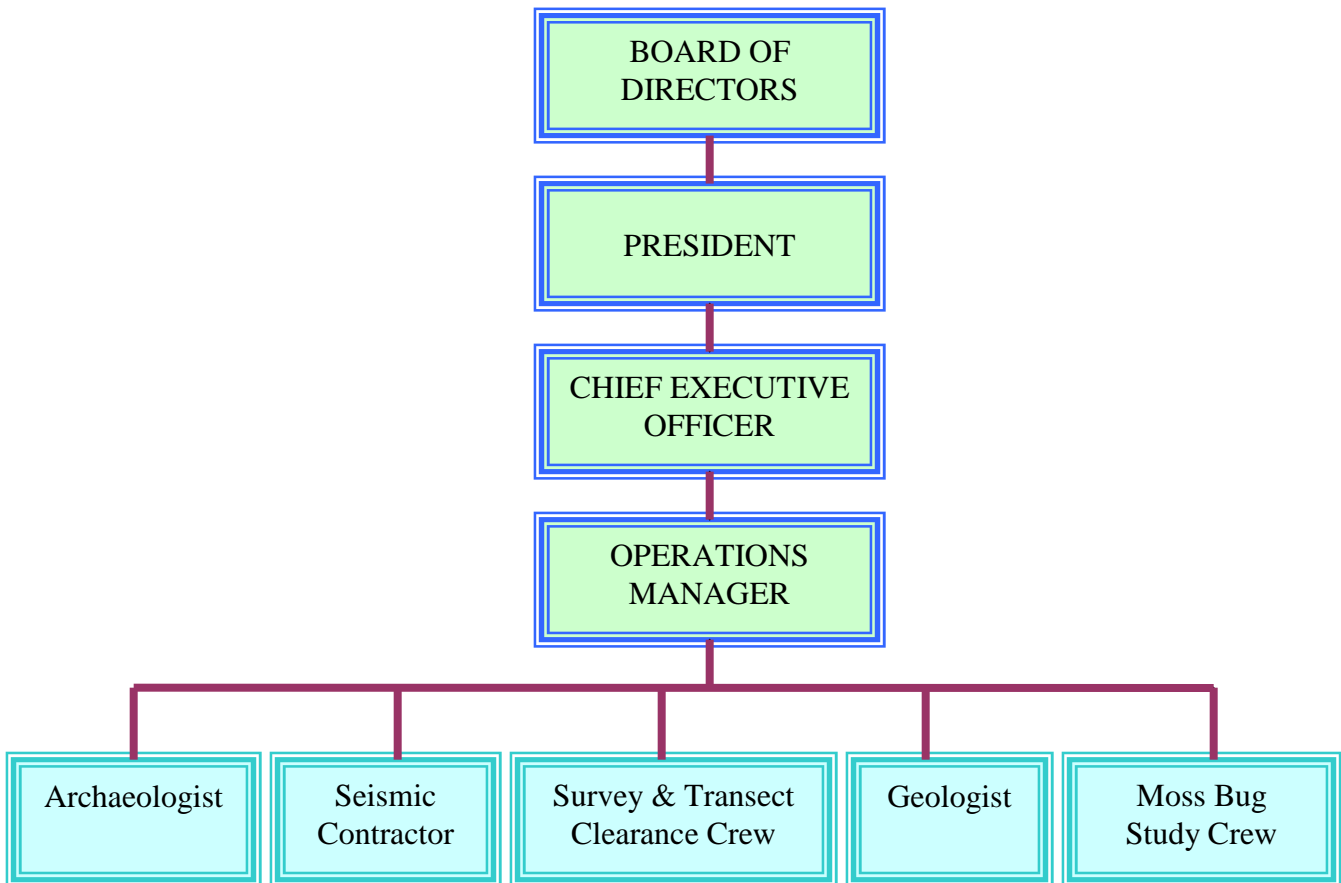


Figure 1.4: Anticipated management structure for US Capital Energy Belize Ltd.

management structure, an executive and an administrative arm will be formed. The Executive arm will consist of the principal investors who will form the Board of Directors. On site management will consist of a Chief Executive Officer and under him/her a series of line managers and associated contractual service providers. Because of the need to respond to disasters and emergency situations there will be a need to closely integrate all aspects of management to a functional and holistic whole, able to work seamlessly together. Convergence within the management structure will therefore be a main priority for the company. Although names of individuals occupying all the positions cannot at this time be posted a likely management scheme during the fully explorational and operational period of the project is shown in Figure 1.4.

1.12 Phases of Project Implementation

Development of the proposals is due to commence as soon as the necessary legal and planning requirements have been met including environmental clearance. The original project schedule has been delayed following the court injunction and future progress in implementing the activities on any phase will depend on weather conditions, regional social factors and time requirements for mitigation measures to be implemented as stipulated by the DoE. Notwithstanding this, the project will be implemented in three (3) stages. The project proponents expect to execute the main activities associated with the project as summarized in **Table 1.1**.

The entire project should be completed within the time period specified in the table barring any unforeseen or calamitous event such as natural disasters or other occurrence beyond the control of the project proponents and providing that the necessary permits and clearances can be obtained.

TABLE 1.1: STAGES OF PROJECT IMPLEMENTATION

Phase	Time Frame	Activity
Phase I	4 – 6 months continuous working	Surveying
		Line Cutting
		Seismic studies
		Selection of drill sites
		Construction of access roads
Phase II	Approximately 1 year	Preparation of drilling site
		Installation of drilling rig
Phase III	indefinitely	Construction of crude oil pipeline
		“ storage tanks
		Upgrading of access roads