

# Sasol Petroleum Mozambique

## AREA A Exploration Well

### Civil Early Works

### Scope of Work

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 1 of 24
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AREA A Exploration Well Civil Early Works

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			Issued for PMT Review

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 2 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

AREA A Exploration Well Civil Early Works

**CONTENTS**

<b>1.</b>	<b>ABBREVIATIONS &amp; DEFINITIONS</b> .....	<b>4</b>
<b>2</b>	<b>INTRODUCTION</b> .....	<b>5</b>
<b>3</b>	<b>CIVIL SCOPE OF WORK</b> .....	<b>6</b>
3.1	General .....	6
3.2	Ordinance Clearing / Demining .....	6
3.3	Babane – 1 Wellpad & Staging Area .....	7
3.4	Babane – 1 Drillers Camp Compound & Medevac Heli Pad .....	8
3.5	New Access Road to Babane – 1 Well Pad, Drillers Camp and Staging Area .....	9
3.6	Upgrade Existing Dirt Road .....	9
3.7	Re-visit Site to install temporary culvert strengthening and assess and repair any damage on access roads .....	10
<b>4</b>	<b>APPENDICES</b> .....	<b>11</b>
4.1	Appendix A: Babane -1 Pad Overall Layout .....	11
4.2	Appendix B: Babane – 1 Well Pad Construction Designs .....	12
4.3	Appendix C: Babane – 1 Drillers Camp Compound Layout .....	16
4.4	Appendix D: Babane – 1 Drill Water Reservoirs .....	17
4.5	Appendix E: Babane – 1 Access Road Construction & Upgrade Details.....	18
4.6	Appendix F: Sasol Specifications .....	24

**1. ABBREVIATIONS & DEFINITIONS**

<b>Abbreviation</b>	<b>Description</b>
AASHTO	American Association of State and Highway Transportation Officials
EGL	Existing Ground Level
m	Metre
MOD	Modified
OMC	Optimum Moisture Content
SABS	South African Bureau of Standards
SANS	South African National Standard
SEPI	Sasol Exploration and Production International
SPM	Sasol Petroleum Mozambique
THK	Thick
UXO	Unexploded Ordinance

**Table 1.1: Abbreviations Used in the Document**

The following definitions shall apply throughout this document.

EMPLOYER	Sasol Petroleum Mozambique (SPM)
CONTRACTOR	Construction Contractor undertaking the works defined herein

## AREA A Exploration Well Civil Early Works

### 2 INTRODUCTION

It is planned to undertake a drilling campaign in Area A comprising the drilling of a single exploration well; named Babane–1 during the dry season of 2016.

The Scope of Work defined herein relates to the Civil Early Works associated with the preparation of the Babane-1 well pad, associated facilities and road access to the pad area planned to be undertaken during the dry season of 2015.

The *Work Areas* are located in Area A, in the Inhambane Province of Mozambique.

The Babane-1 Exploration Well is located at coordinates 22°15'21.1"S 33°44'39.2" E approximately 45km south west of the town of Mabote.

The well location is approximately 7km from an existing dirt track and can be accessed along existing cleared seismic survey cut lines.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 5 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

### 3 CIVIL SCOPE OF WORK

#### 3.1 General

The early civil engineering works contract is intended to encompass the creation of a single new wellpad; Babane-1, including associated infrastructure and upgrade of existing roads from Mabote and will encompass the following:

- Construction of approximately 7 kilometres of new roads in Area A field;
- Upgrade to sections of approximately 60 kilometres of existing dirt roads from Mabote to Lake Banamana not completed by National Roads Authority under current upgrade works programme.
- Upgrade to sections of 42 kilometres of existing dirt roads from Lake Banamana to Babane–1 Pad Turn-off
- Site Preparation and perimeter fencing for a new Drilling Camp;
- Construction of a combined single wellpad and staging area compound comprising the following works:
  - Site preparation works;
  - Perimeter Fencing, gates and personnel turn stile;
  - Construction of well cellar;
  - Construction of flare pit;
  - Construction of lined cuttings pit;
  - Construction of guard house;
  - Construction of Two Drill Water Reservoir Pits
  - Drilling of two water wells

A more detailed description and requirements is outlined in the following sections.

#### 3.2 Ordinance Clearing / Demining

The *Working Areas* of the *works* will have been demined by an approved ordinance clearance specialist prior to the *Contractor* commencing the *works*. However, should any unexploded ordnance (UXO) be discovered during execution of the remaining *works* then all construction activities in that area are required to cease immediately and the *Employer* informed for further instruction.

The Contractor is required to ensure that his activities are restricted to the demined area and that suitable barriers/signs are erected and all employees and subcontractors are informed.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 6 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works

### **3.3 Babane – 1 Wellpad & Staging Area**

Build new well pad compound: Reference: Appendix A & B; Babane -1 Pad Overall Layout & Construction Designs

- Clear and Grub
- Ground Penetrating Radar Survey other site (by others)
- Strip topsoil to stockpile for re-use on slopes (100mm thick)
- Rip and re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Borrow to fill (end tip method), compacted 93% MOD AASHTO applying water to achieve OMC
- Gravel Wearing course, 150mm thick, compacted 95% MOD AASHTO
- Open borrow pits for gravel and fill
- Rehab borrow pits on completion

Supply & Erect new perimeter fencing, gates and guard house: Reference: Appendix A & B Babane -1 Pad Overall Layout & Construction Designs

- Perimeter fencing 1.8m high as per Sasol Specification
- 2 no. Lockable Double Leaf 6m wide gates; 1.8m high
- 1 no. Lockable Single Leaf personnel gate; 1.8m high
- Construct Guard House

Construct new reinforced concrete cellar: Reference: Appendix B; Well Pad Construction Designs

- Excavate through prepared compound and compact formation
- Install blinding concrete
- Cast cellar base slab with wall kickers.
- Cast cellar walls
- Backfill and compact using as-dug material around cellar wall applying water to achieve OMC and re-instate Gravel Wearing course

Construct new Cuttings Pits: Reference Appendix A & B; Babane -1 Pad Overall Layout & Construction Designs

- Excavate through prepared compound to required profile
- Compact formation and place 50mm soft sand to inner floor of pits and sloping sides.
- Install 1.5mm thick plastic liner
- Place and compact as-dug material around perimeter to secure liner

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 7 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works

Construct new Flare Pit just inside perimeter fence: Reference: Appendix A & B; Babane -1 Pad Overall Layout & Construction Designs

- Excavate through prepared compound to required pit profile and compact formation
- Place and compact as-dug material in layers to form Flare berm

Drilling of Water Wells

- Provide all necessary equipment and drill 2no. water boreholes (location to be agreed with *Employer*.)
- Supply and install submersible pump with minimum delivery of 25 litres/ min / well at each well

Construct two new drill water reservoirs: Reference; Well Pad Construction Appendix D; Drill Water Reservoirs

- Clear and Grub
- Excavate through prepared compound to required profile placing and compacting fill to form perimeter embankments applying water to achieve OMC .
- Compact formation and place 50mm soft sand to inner floor of reservoir and sloping sides.
- install 550g / m<sup>2</sup> PVC liner
- Lay and compact as-dug material around perimeter of liner

### **3.4 Babane – 1 Drillers Camp Compound & Medevac Heli Pad**

Build new drillers camp compound: Reference: Appendix C; Babane – 1 Drillers Camp Compound Layout

- Clear and Grub
- Strip topsoil to stockpile for re-use on slopes (100mm thick)
- Rip and recompact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Borrow to fill (end tip method), compacted 93% MOD AASHTO applying water to achieve OMC
- Gravel Wearing course, 75mm thick, compacted 95% MOD AASHTO
- Open borrow pits for gravel and fill (can be shared with Well Pad works)
- Rehab borrow pits on completion

Erect new perimeter fencing, gate and guard house: Reference Appendix C; Babane – 1 Drillers Camp Compound Layout

- Perimeter fencing 1.8m as per Sasol Specification
- Lockable Double Leaf 6m wide gate; 1.8m high
- Lockable Single Leaf personnel gate; 1.8m high
- Construct Gate House

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 8 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				



## AREA A Exploration Well Civil Early Works

Build new medevac helipad: Reference: Appendix C; Babane – 1 Drillers Camp Compound Layout

- Clear and Grub
- Strip topsoil to stockpile for re-use on slopes (100mm thick)
- Rip and re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Perimeter fencing 1.8m as per Sasol Specification
- Lockable Double Leaf 6m wide gate; 1.8m high
- Install Aviation approved Wind Sock

### **3.5 New Access Road to Babane – 1 Well Pad, Drillers Camp and Staging Area**

Build new access road from existing dirt track following existing seismic survey lines where possible: Reference: Appendix E; Babane–1 Access Road Construction & Upgrade Details

- Detailed survey of proposed route and alternate route
- Clear and Grub
- Strip topsoil to stockpile for re-use on slopes (100mm thick)
- Rip and re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Excavate parallel drainage ditches placing and compacting as dug material on compacted 93% MOD AASHTO road formation applying water to achieve OMC
- Borrow to fill (end tip method), compacted 93% MOD AASHTO applying water to achieve OMC
- Gravel Wearing course, 75mm thick, compacted 95% MOD AASHTO
- Excavate mitre drains
- Open borrow pits for gravel and fill (can be shared with Well Pad works)
- Rehab borrow pits on completion

### **3.6 Upgrade Existing Dirt Road**

Upgrade existing dirt road from Lake Banamana to seismic line turn-off: Reference: Appendix E; Babane – 1 Access Road Construction & Upgrade Details

- Detailed survey of proposed route identifying areas for upgrade / repair
- Clear and Grub
- Rip and re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Excavate parallel drainage ditches placing and compacting as dug material on compacted 93% MOD AASHTO road formation applying water to achieve OMC
- Borrow to fill (end tip method), compacted 93% MOD AASHTO applying water to achieve OMC
- Gravel Wearing course, 75mm thick, compacted 95% MOD AASHTO
- Excavate mitre drains
- Open borrow pits for gravel and fill
- Rehab borrow pits on completion

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 9 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works

Upgrade sections of existing dirt road from Mabote to Lake Banamana not completed by National Roads Authority under current upgrade works programme: Reference: Appendix E; Babane–1 Access Road Construction & Upgrade Details.

- Detailed survey of proposed route identifying areas for upgrade / repair / re-alignment
- Clear and Grub widened and re-aligned sections
- Rip and re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Excavate parallel drainage ditches placing and compacting as dug material on compacted 93% MOD AASHTO road formation applying water to achieve OMC
- Borrow to fill (end tip method), compacted 93% MOD AASHTO applying water to achieve OMC
- Gravel Wearing course, 75mm thick, compacted 95% MOD AASHTO
- Excavate mitre drains
- Open borrow pits for gravel and fill
- Rehab borrow pits on completion

Upgrade elevated embankment road across Lake Banamana.

- Detailed survey of elevated embankment road identifying areas for upgrade / repair
- Clear and remove topsoil, set aside for re-use
- Excavate, replace and re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- Borrow to fill (end tip method), compacted 93% MOD AASHTO applying water to achieve OMC
- Replace topsoil to embankment slopes

### **3.7 Re-visit Site to install temporary culvert strengthening and assess and repair any damage on access roads**

Re-visit site immediately following 2015/16 rainy season and undertake temporary culvert strengthening works aqnd necessary repairs to access roads following rainy season and.

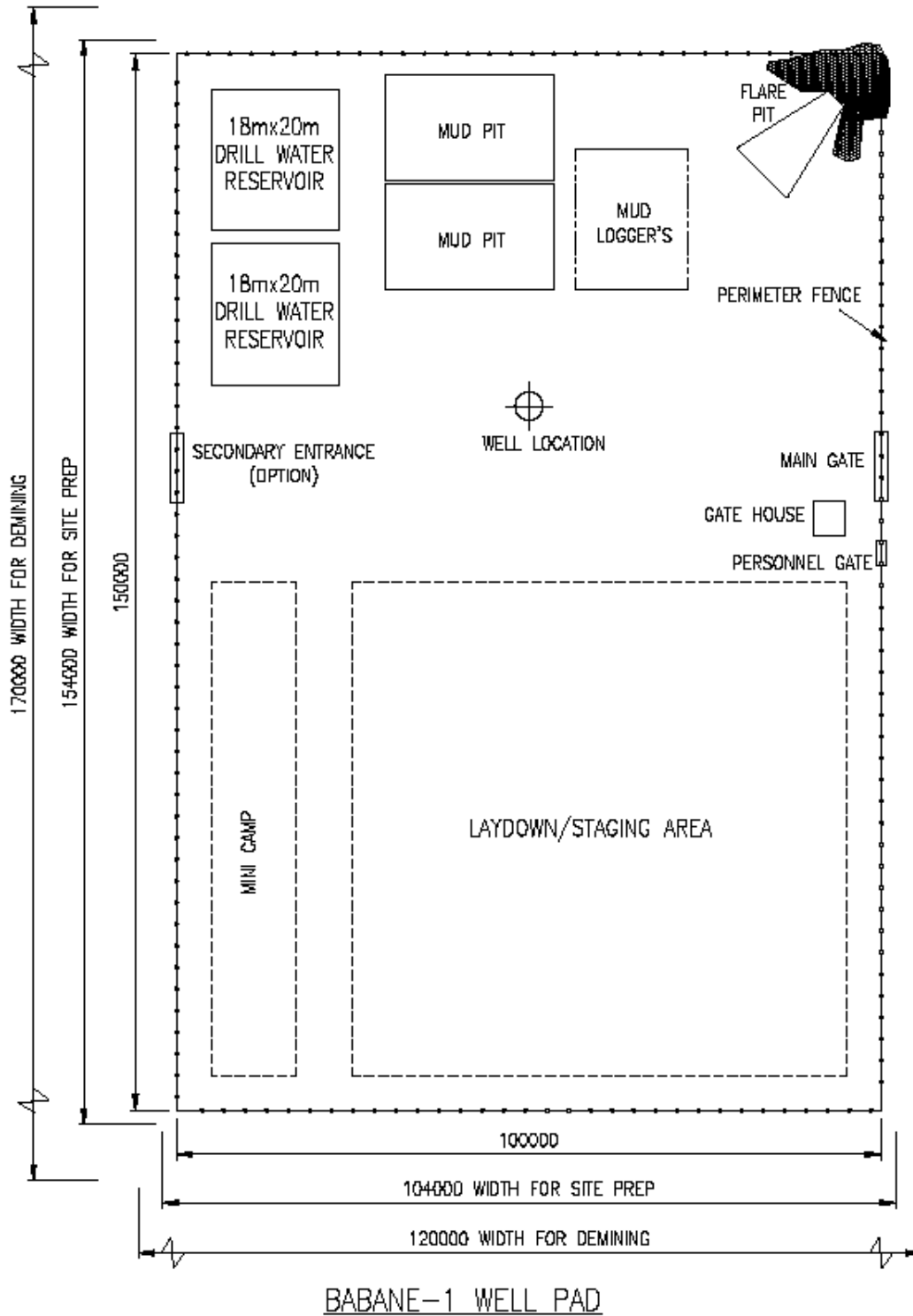
- Install temporary spreader beams props & struts within road culvert
- Detailed survey of access road identifying areas for repair
- Clear drainage ditches placing and compacting as dug material on compacted 93% MOD AASHTO road formation applying water to achieve OMC
- Re-compact insitu material to 93% MOD AASHTO applying water to achieve OMC
- re-instate Gravel Wearing course, 75mm thick, compacted 95% MOD AASHTO

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 10 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

AREA A Exploration Well Civil Early Works

**4 APPENDICES**

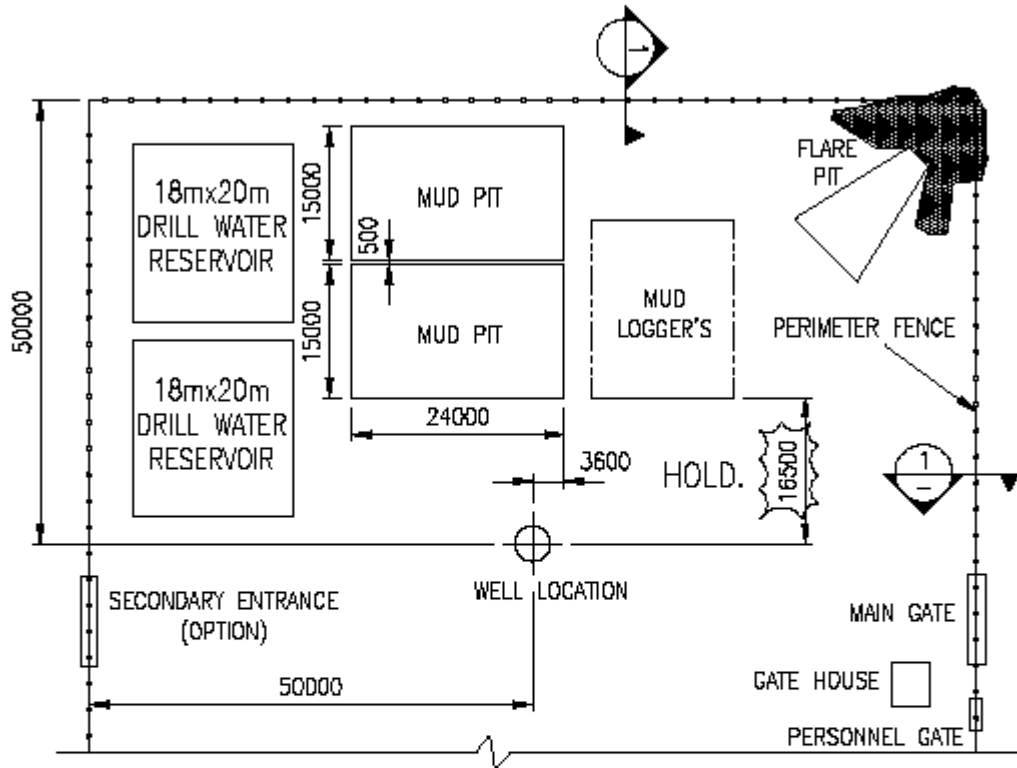
**4.1 Appendix A: Babane -1 Pad Overall Layout**



Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 11 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

AREA A Exploration Well Civil Early Works

**4.2 Appendix B: Babane – 1 Well Pad Construction Designs**



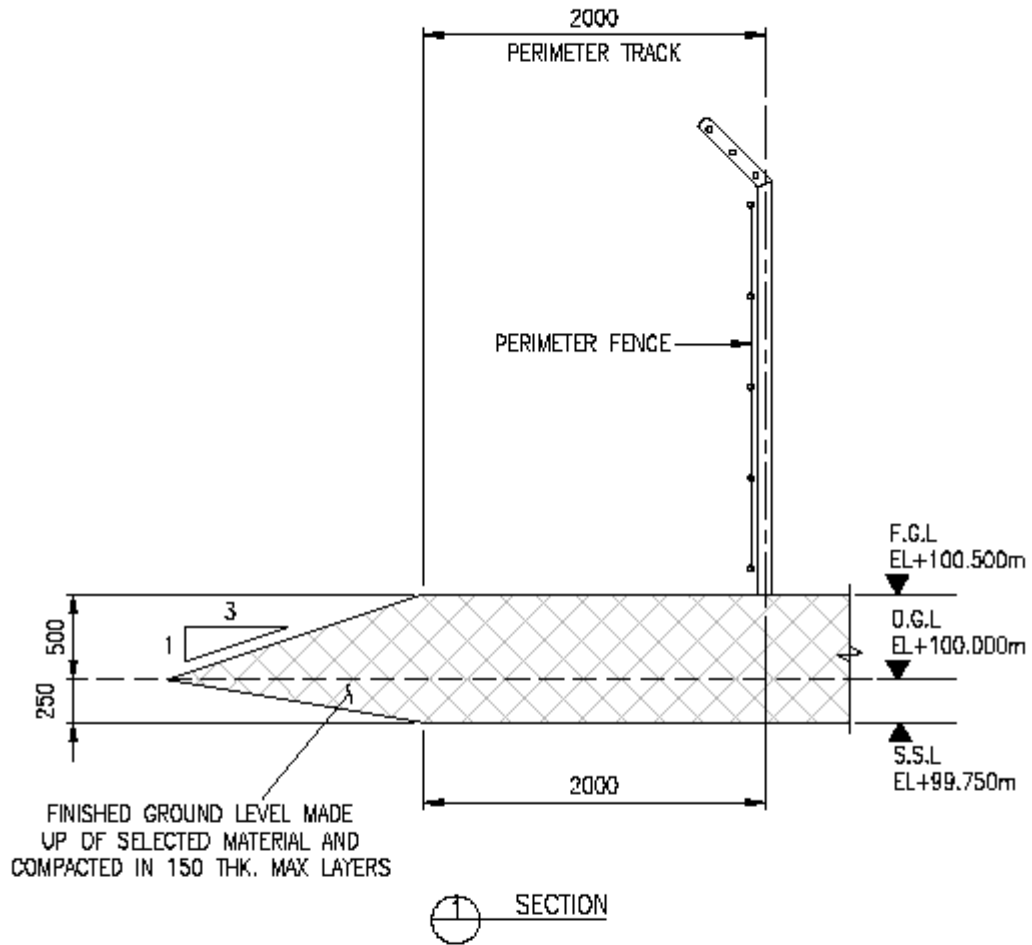
PLAN VIEW WELL PAD

NOTES

1.  FOR ILLUSTRATION PURPOSES ONLY (I.E. NOT PART OF WELLSITE PREPARATION WORK)
2. ALL MEASUREMENTS ARE IN mm
3. MUD PIT SHOULD BE ALIGNED IN SUCH A MANNER THAT IT IS PARRALLEL TO THE CELLAR EDGES
4. DIMENSION ON HOLD AWAITING RIG FOOTPRINT

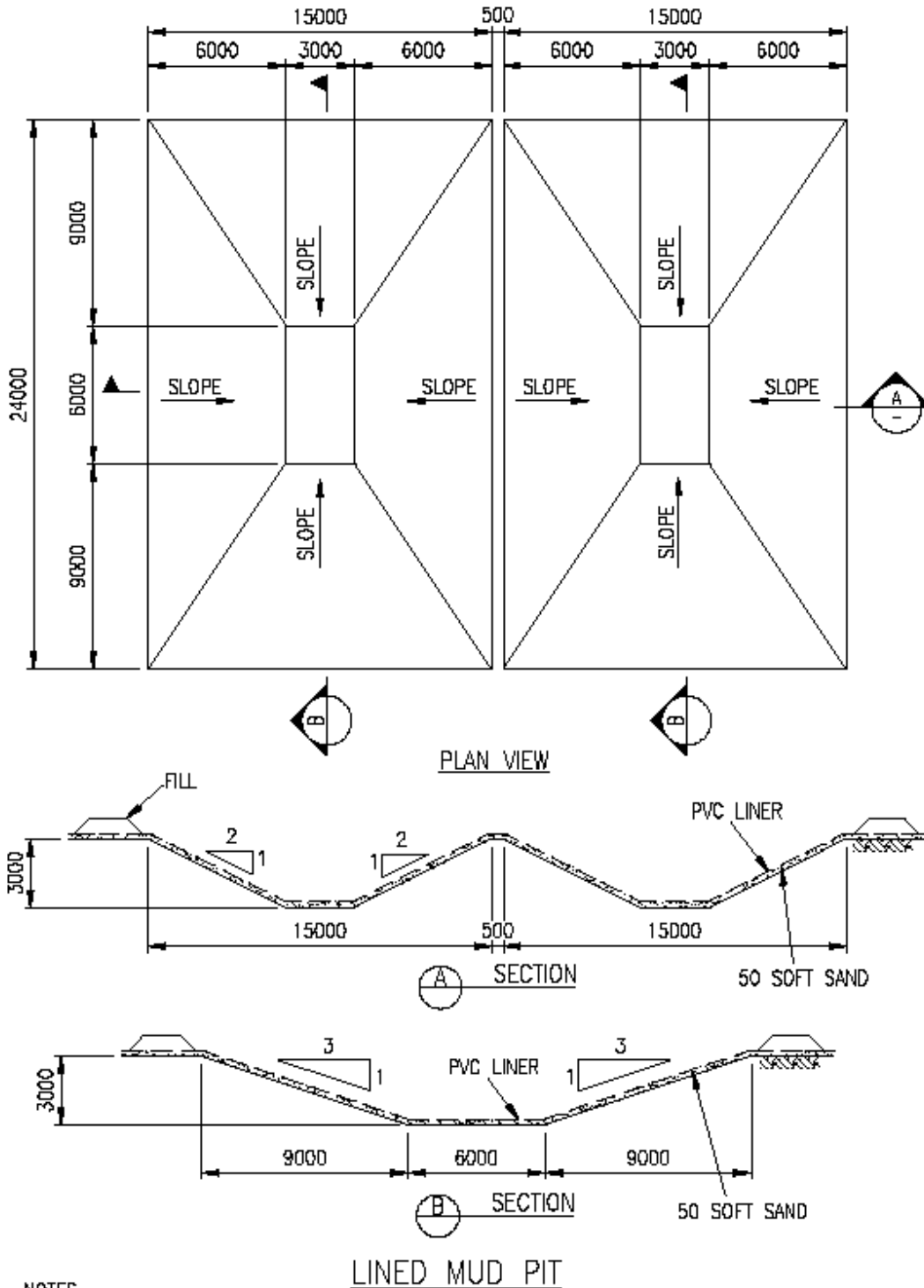
Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 12 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

AREA A Exploration Well Civil Early Works



Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 13 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works



**NOTES**

1. ALL MEASUREMENTS ARE IN mm
2. MUD PIT SHOULD BE ALIGNED IN SUCH A MANNER THAT IT IS PARALLEL TO THE COLLAR EDGES
3. MUD PIT SHOULD BE LINED WITH PLASTIC TO PREVENT CONTAMINATED WATER SEEPAGE INTO THE GROUND

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 14 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works

The following ThyssenKrupp drawings associated with the Temane PSA Surface Development are applicable and shall be utilised for the Babane-1 Exploration Well Pad

<b>Drawing Number</b>	<b>Drawing Title</b>
MSDP1301-SPI-S000-08310-DLY-0002	Well Pit General Arrangement* <sup>1</sup>
MSDP1301-SPI-S000-08310-DLY-0003	Well Pit Reinforcement Details* <sup>1</sup>
MSDP1301-SPI-S000-08310-DDT-0001	Flare Pit General Arrangement
MSDP1301-GEN-S098-08310-DCF-0003	Fencing and Gates
WGH.1.2	Guard House

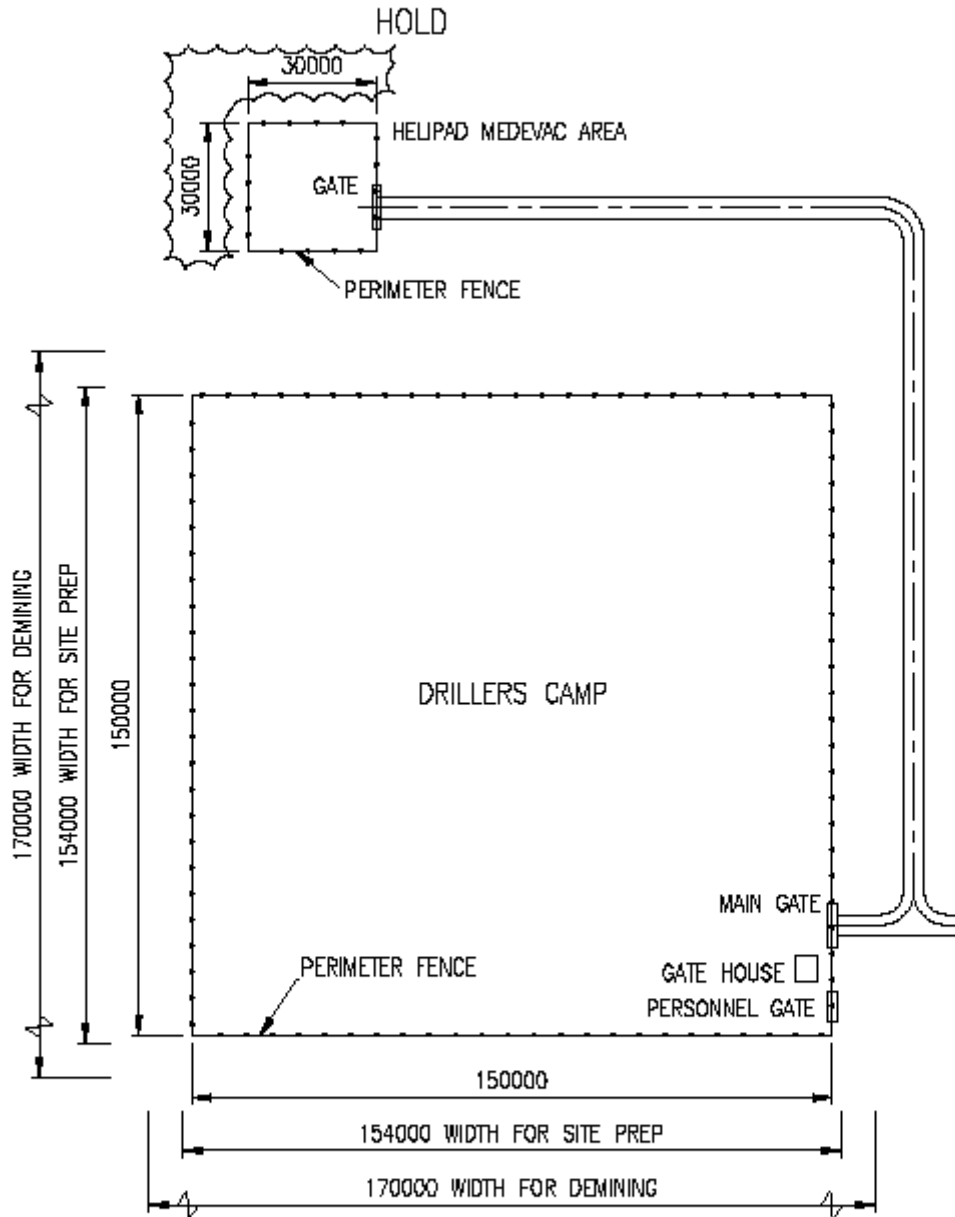
### **Note**

1. Clear opening in cellar base shall be 800mm dia for Babane-1 Well Pad

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 15 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

AREA A Exploration Well Civil Early Works

**4.3 Appendix C: Babane – 1 Drillers Camp Compound Layout**



DRILLERS CAMP & MEDEVAC HELIPAD

**NOTES**

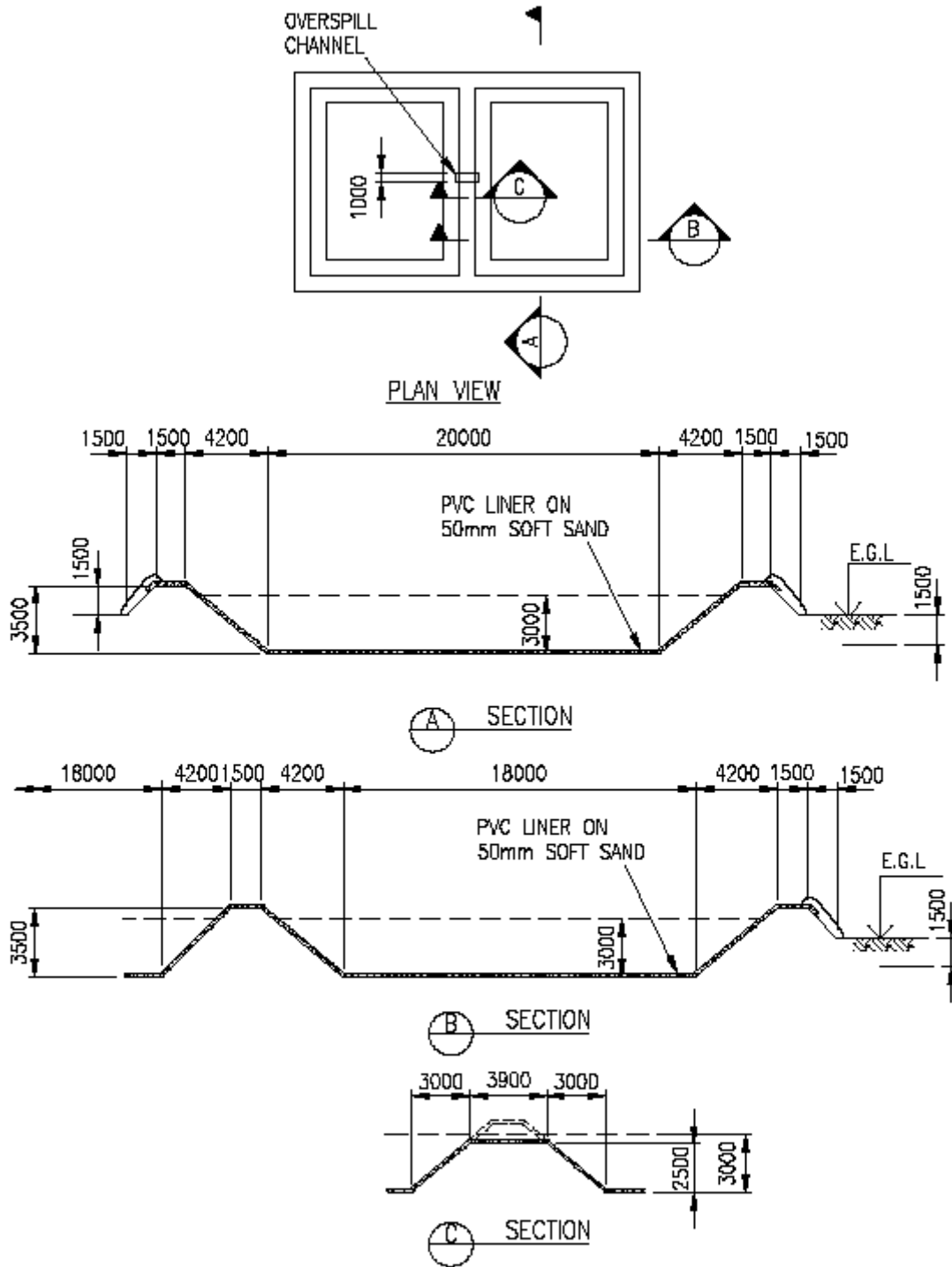
1. ALL MEASUREMENTS ARE IN mm

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 16 of 24
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AREA A Exploration Well Civil Early Works

**4.4 Appendix D: Babane – 1 Drill Water Reservoirs**



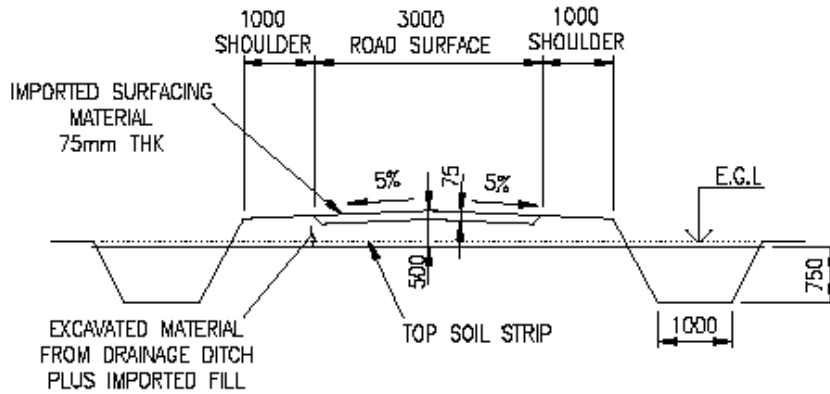
DRILL WATER RESERVOIR

1. ALL MEASUREMENTS ARE IN mm

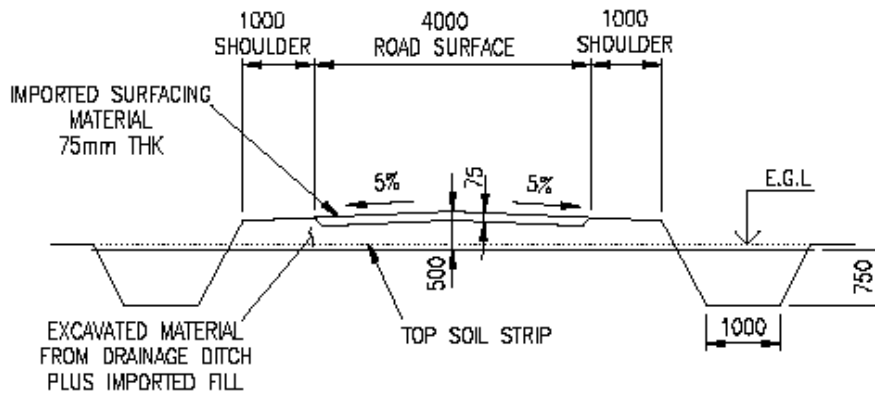
Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 17 of 24
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AREA A Exploration Well Civil Early Works

**4.5 Appendix E: Babane – 1 Access Road Construction & Upgrade Details**



NEW ROAD CONSTRUCTION PROFILE



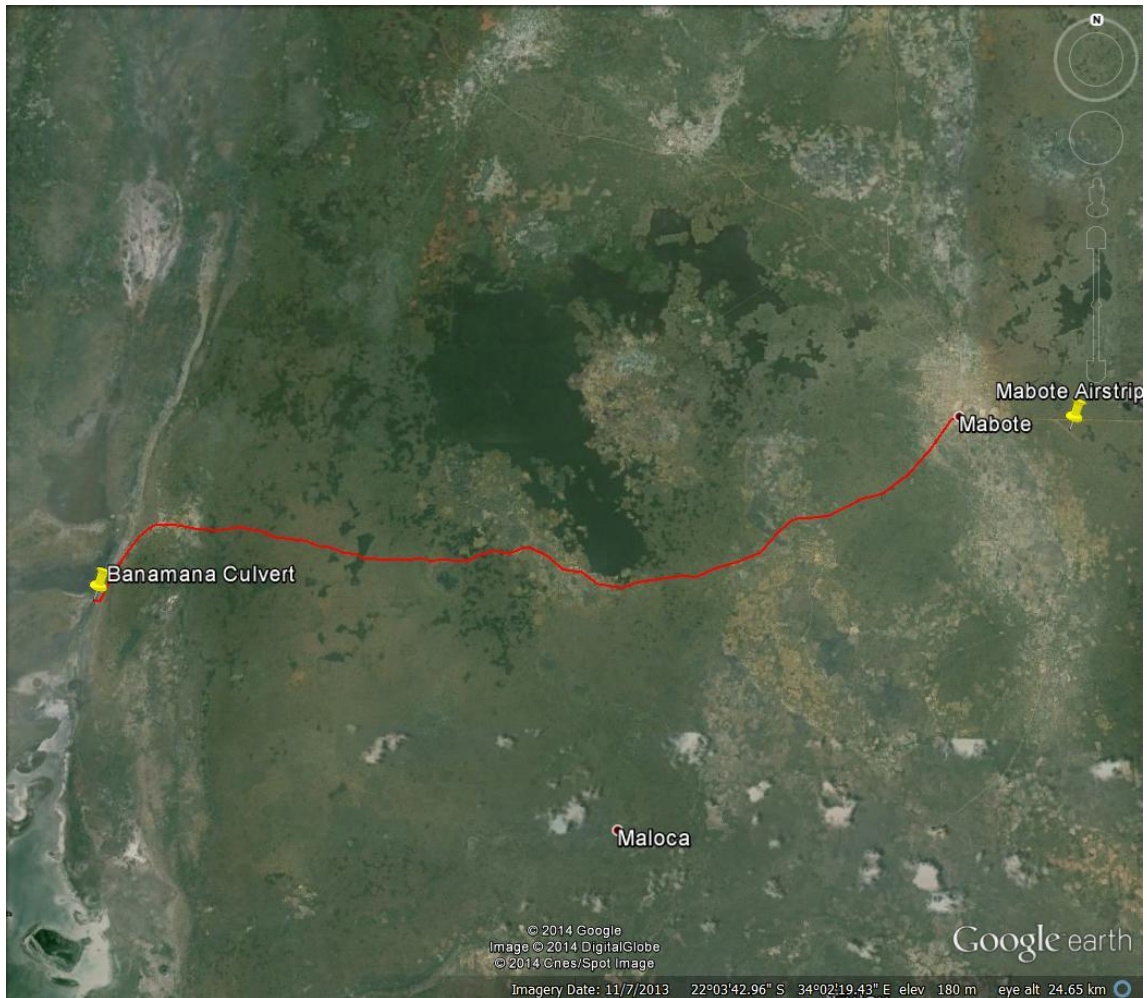
ROAD UPGRADE CONSTRUCTION PROFILE

NOTES

1. ALL MEASUREMENTS ARE IN mm

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 18 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works



### **Existing Mabote to Lake Banamana Dirt Road (circa 25km)**

#### Notes

1. *Contractor* to establish by survey and agree with *Employer*, sections of existing road requiring upgrade.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 19 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works



### **Lake Banamana Road Embankment (circa 400m)**

#### Notes

1. *Contractor* to establish by survey and agree with *Employer*, sections of existing embankment requiring repair / upgrade.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 20 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works



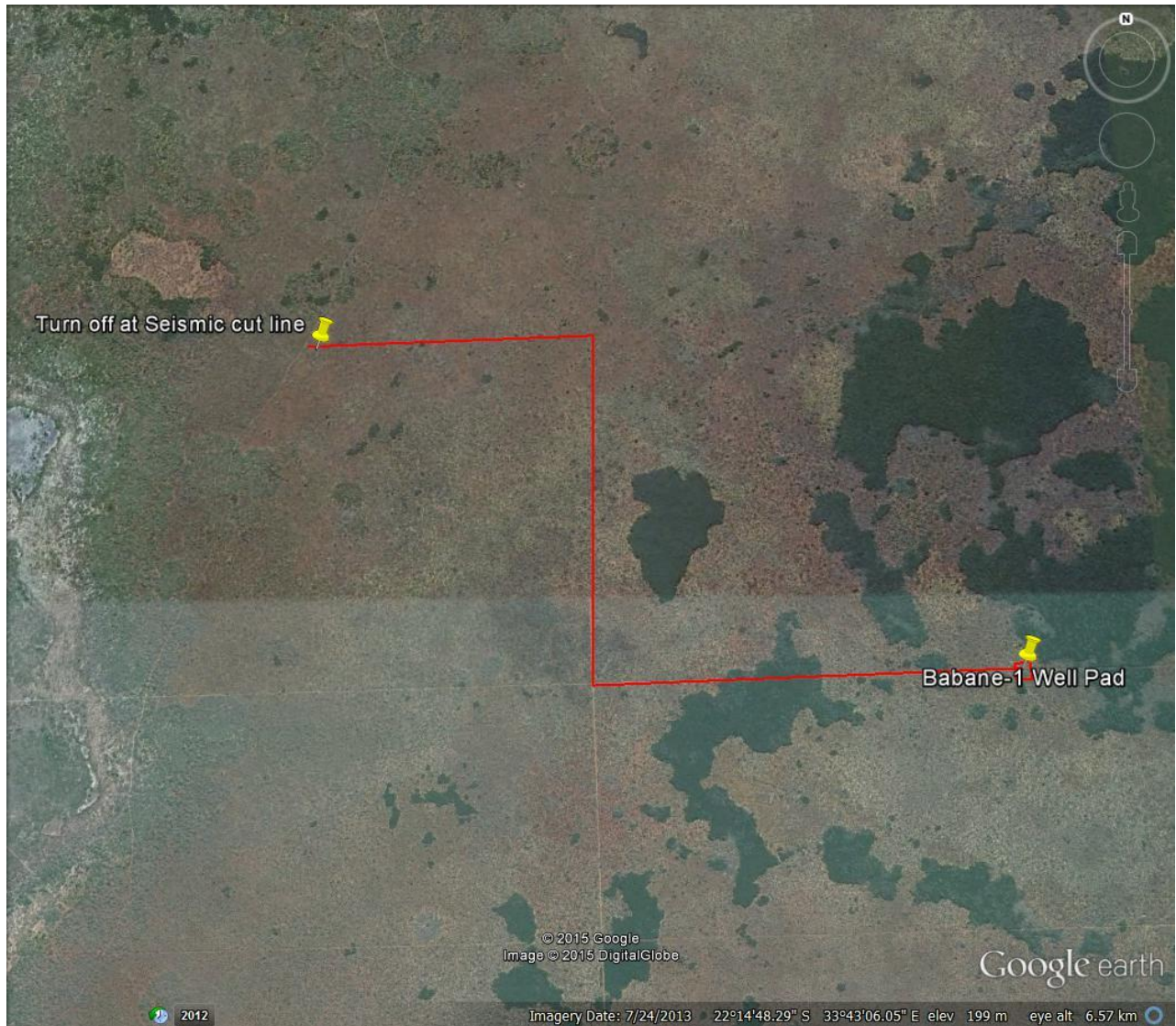
### **Existing Dirt Road Lake Banamana to Well Pad Turn Off (circa 34km)**

#### Notes

1. *Contractor* to establish by survey and agree with *Employer*, sections of existing road requiring upgrade.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 21 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

## AREA A Exploration Well Civil Early Works



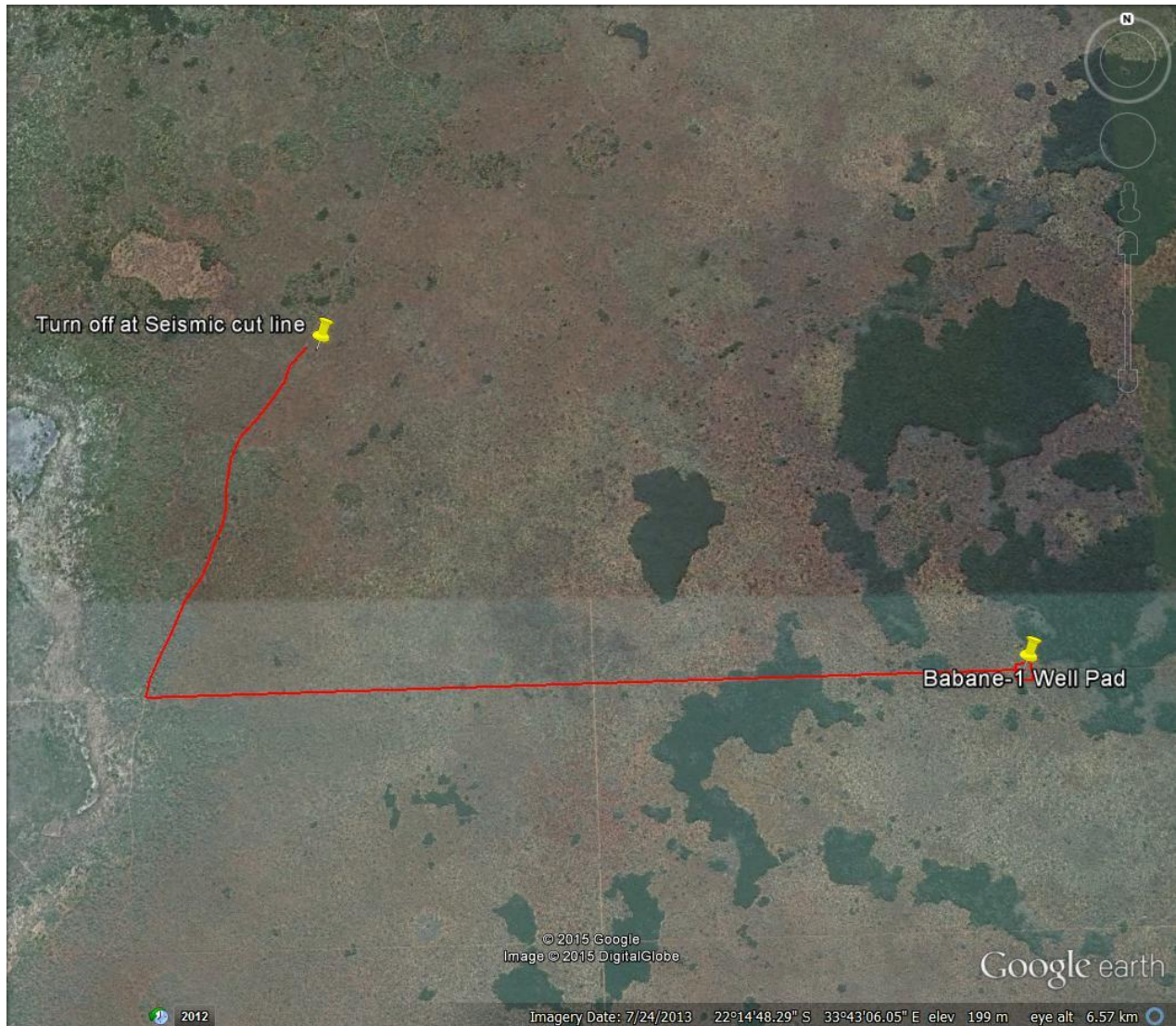
**Proposed alignment for New Road to Babane-1 Well Pad following Seismic cut lines (circa 7km)**

### Notes

1. *Contractor* to survey and agree with *Employer*, alignment of new road.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 22 of 24
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## AREA A Exploration Well Civil Early Works



**Alternate alignment of New Road to Babane-1 Well Pad following Seismic cut lines (circa 5.5km) and upgrade to exist dirt track (circa 2.5km)**

### Notes

1. Contractor to survey and agree with Employer, alignment of new road.

Document Title: AREA A Exploration Well Civil Early Works:Scope of Work	Document No:	Version:	Date: Jan 2015	Page: 23 of 24
This document is considered an uncontrolled copy when printed. Always ensure that you print and use a current version.				

AREA A Exploration Well Civil Early Works

**4.6 Appendix F: Sasol Specifications**

Specification Number	Specification Title
SP-00-07 Rev 1 -	Road earthworks
SP-00-06 Rev 2 -	General earthworks excavation
SP-20-02 Rev 4 -	Fencing
SP-10-01 Rev 1 -	Concrete construction
SP-20-05 Rev 1 -	Topographic and plant surveys