**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS** 

PROPOSED CONSTRUCTION OF A 3 KM PIPELINE AND ASSOCIATED INFRASTRUCTURE ON PORTIONS O AND 5 OF FARM SAND DRAAI 391, NEAR GROBLERSHOOP, NORTHERN CAPE



# **BACKGROUND INFORMATION DOCUMENT**

(September 2014)

DEA Reference: 14/12/16/3/3/1/1214

# What does this document tell you?

This document aims to provide you, as an **Interested and Affected Party** (I&AP), with background information regarding the proposed **construction of a 3 km pipeline and associated infrastructure** being undertaken by **ACWA Power Solafrica Bokpoort CSP Power Plant (Pty) Ltd**.

The document also provides information regarding the **Basic Environmental Impact Assessment** (BA) process to be undertaken. The document advises you on how you can become involved in the project – by reviewing information, and making inputs thereon, including raising any possible issues. This sharing of information forms the basis of the **public participation process** and offers you the opportunity to become actively involved in the project from the outset. Public participation allows for local knowledge to be integrated into the BA as generated.

What does the project entail?									
The project can be summarised as follows:									
Project name	Basic Assessment for the Proposed Construction of a 3 km Pipeline and Associated Infrastructure on Portions 0 and 5 of Farm Sand Draai 391, near Groblershoop, Northern Cape								
Local authority	!Kheis Local Municipality – Northern Cape								
Landowner(s)	Mr. Johannes Fourie (Farm Sand Draai 391)								
Location	Located on Portions 0 and 5 of the farm Sand Draai 391. Travel along the N10 towards Groblershoop, turn left onto the N10 towards Griekwastad. Travel along the N10 for approximately 4 kms and turn left towards the farm Sand Draai.								
	Pipeline STARTING POINT (PREFERRED)								
	Latitude / Longitude		Degrees		Minutes		Seconds		
	Souin Fast		280		4/' E2/		10.9	10.92"	
				53			14.0	10	
	STARTING POINT (ALTERNATIVE)								
	Latitude / Longitude	Degrees		Minutes		Sec	Seconds		
Co-ordinates	South		280		46'		54.4	2"	
				34 40.13					
	Latitude / Longitude		Degrees		Minutes		Seconds		
	South		280		40 53'		18.9	18.94	
	Pump Station								
		Latitude / Longitude		Degrees		Minutes		Seconds	
	Corner 1	South		280		47′		9.86''	
		East		210		53'		14.31″	
	Corner 2	South		280		4/'		10.21"	
	C	East		210		53'		14.3/"	
	Corner 3	her 3 South			280			10.16″	

		Z 1 '	53	14.89"
Corner 4 S	South	28 <sup>0</sup>	47'	9.78″
E	East	21 <sup>0</sup>	53'	14.82″

# Description of the proposed project

On 14 June 2011, Solafrica Thermal Energy (Pty) Ltd received Environmental Authorisation for the Construction of a 75 *MW Concentrated Solar Thermal Power (CSP) Plant and associated infrastructure in the Siyanda District Municipality, Northern Cape (DEA Ref 12/12/20/1920).* 

In addition, a Basic Assessment study for a 15 km water pipeline to the CSP plant was conducted in 2012 that sought environmental authorisation for the following infrastructure:

- the water pipeline (extending from the Orange River through the farm Sand draai 391 and terminating at the farm Bokpoort 390);
- a pump station on the farm Sand draai 391; and

storage ponds as well as associated infrastructure on the approved CSP site on portion 0 of the farm Bokpoort 390.

An environmental authorisation (Ref No: 14/12/16/3/3/1/591) was granted for the pipeline on 8 March 2013.

Since the authorisation, a refinement of the design, mostly due to abstraction point challenges, has taken place that has resulted in the proposed re-alignment of approximately **3 km** of underground PVC water pipeline with a diameter of approximately **315 mm** of the previously authorised pipeline, as well as the substitution of storage ponds with storage/regulation tanks in line with the industry standard design for bulk raw water storage in CSP plants worldwide.

After studies were undertaken at the river intake point, it was established that during some months of the year, it will not be possible to abstract water due to level changes that occur during the different seasons. Therefore, a decision was made to change the water abstraction point to a new point (Shalom) (indicated by the blue circle on locality map) and this will result in a re-alignment of the original (approved) route by 3 km from the abstraction point (indicated in green on the locality map, Figure 1, below).

The proposed 3 km re-alignment and associated infrastructure traverses only one farm, namely Sand draai 391.

The objective of constructing the proposed pipeline is to supply filtered water from the Orange River to the approved CSP plant that is currently undergoing construction.



Figure 1: Locality Map

# The pipeline alignment alternatives relate to two proposed routes:

- Pipeline alignment from the pump station on the approved alignment, along existing farm roadway servitude to Shalom point (preferred); or
- A diagonal route from a point along the approved alignment, along an existing farm boundary fence to Shalom point (not preferred).

The pipeline alignment along the existing farm roadway servitude is the shortest route, and trevails a largely transformed landscape.

# Associated infrastructure required includes:

#### **New Proposed Abstraction Point (Shalom)**

The newly proposed abstraction point called Shalom, is an *existing* abstraction point (see Figure 2 below). Although there is no site alternative for the abstraction point, there are two alternative options for abstracting water from the river: either through the use of a Floating Intake System (Raft Structure) or Infiltration Galleries. The Floating Intake System is the preferred option as it is easier to construct, more cost effective and a less intrusive method than the Infiltration Galleries. Infiltration Galleries would have a far larger footprint area within the sensitive riparian zone along the Orange River.

The water will then be pumped from the new abstraction point through a 250 mm uPVC pipeline to a pump station approximately 340 m away from the river.



Figure 2: New (Shalom) Abstraction Point

Details of the raw water pump installation proposed are as follows:

- Two pumps are to be stationed on a stainless steel floating device (raft) which will be anchored to concrete blocks. These anchor blocks will be on both sides of the quick coupling pipes on the side of the embankment fill and will be used to connect the raft when the water level rises.
- The pumps will not operate simultaneously, but will be altered automatically. In the case of one pump failing, the other pump will serve as the backup.
- Stabilizing of river embankment at raw water extraction point must be done by means of Gabions, Reno mattresses or stone pitching.
- Each pump is designed to deliver water at a flow rate of 210 m<sup>3</sup>/h from the abstraction point; this is 10% more than required. Providing a higher flow in the raw water rising main than the clear water rising main will ensure that the storage reservoir is always full and that the pumps are not required to pump 24 h/day.
- Each pump will be driven by 45 kW 400 V electric motors. The motor speed will be 1450 r.p.m. to avoid damage to the impellers as a result of silt in the water.
- Larger electrical motors have been sized in order to protect them in the case of a pipe burst.
- The river pump station will be manually controlled or with a timer depending on the operation methods that is chosen.

#### **Raw Water Rising Main to the Filtration Plant**

A 250 mm ø uPVC underground rising main pipeline of pressure Class 9, over a distance of approximately 340 m is

proposed. The flow velocity in the single 250 mm ø PVC rising main will be 1.38 m/s with a maximum pressure of approximately 44.2 m. This high flow velocity is required to prevent silt settling in the line.

The electrical power cable (power supply to the river pump installation) and the instrumentations cable will be installed in the same trench as the rising main. The depth of the pipeline will be approximately 1.15 m, depending on the NGL and the slope of the pipeline. A geotechnical analysis of the ground will be done to determine the amount of hard rock and the ground properties along the pipeline route.

#### **Pump Station Deviation**

The amended design from that previously authorised involves the substitution of storage ponds with storage/regulation tanks in line with the industry standard design for bulk raw water storage in CSP plants worldwide.

# Filtration System

Upon entering the pump station, the water will be treated with a sand filtration system where sand filters will backwash on a time and pressure differential principle. The filtration system will consist of ten (10) CONN40 SAND FILTERS, each capable of handling a flow of 25 -30 m<sup>3</sup>/h. 8 sand filters will be sufficient as the calculations with 25 m<sup>3</sup>/h is conservative, the flow will be 26.5 m<sup>3</sup>/h if 8 filters are used, which is still acceptable. The filtration system is designed with a redundancy of 25% extra, therefore 10 sand filters must be installed. The extra filters will also be able to serve as back-up filters in case some of the filters are out of order to ensure that the required flows are provided.

A short backwash pipeline to a small pond belonging to the farmers will handle the backwash water. The backwash process will be controlled with a timer or a pressure differential switch, located at the control room of the clear water pump station. The filtration system will be housed in the clear water pump station building.

#### Clear Water Pump Station

The clear water pumps proposed will be two multi-stage pumps. These pumps will be stationed in the clear water pump station building and will be as follows:

- Two pumps (WKLN 125/4 horizontal multistage centrifugal pumps or similar), one duty and one standby, will be used.
- Each pump will be driven by 110 kW 400 V electric motors. The motor speed will be 1450 r.p.m. to avoid damage to the impellers as a result of silt in the water.
- The two pumps will be housed in a brick masonry pump house (50 m x 50 m) which will also accommodate the switchgear, distribution board, MCC and backup generator if required.
- The floors of the pump station will be shaped to handle water spillages.
- The motor control room will be equipped with an air conditioner in order to keep the switchgear and motor control centre cool.
- The clear water pump station (on/off) will be controlled by the level sensors or manually.
- The pumps will deliver a minimum flow of 190 m<sup>3</sup>/h at a head of 132.8 m.

## Storage Reservoir at Clear Water Pump Station

A small reservoir with a volume of 260 m<sup>3</sup> is proposed at the clear water pump station building. This will serve as temporary storage for the clear water before it is pumped to the CSP plant. This storage reservoir is required because the sand filters will not be able to handle the high pressures if the water is to be pumped directly from the raw water plant through the sand filters to the solar plant.

The reservoir which will be situated inside the clear water pump station at 28°48'17.37"S 21°53'15.31"E will have the following characteristics:

- It will consist of a covered galvanized sectional steel tank mounted on dwarf walls.
- It will have 6 panels x 6 panels x 4 panels height i.e. (7.32 m x 7.32 m x 4.88 m).

It will be equipped with an ultrasonic level sensor and an overflow. Level control is achieved with the level switches, which will switch the pumps on at 80% and off at full supply level (98%).

From the reservoir, the filtered water will be pumped at 190 m<sup>3</sup>/hr to the storage tanks (2 x 47500 m<sup>3</sup>) located on the southern side of the approved CSP plant site. The two storage tanks at the CSP plant site were previously authorised.

The preferred options take into account the shortest route, with the least environmental impact, to a viable existing abstraction point which simply requires an upgrade to accommodate the volumes of water required for the CSP Plant.

# What are the potential environmental impacts associated with the proposed project?

A number of potential environmental impacts associated with the project have been identified. As part of the BA, these potential impacts will be assessed through the following specialist studies:

Specialist Study	Organisation					
Wetland Assessment	Royal HaskoningDHV (peer reviewed by external independent consultant)					
Ecological Assessment	EnviRoss cc					
Heritage Assessment	McGregor Museum					

Input from the public through the public participation process provides valuable input in the identification of issues requiring investigation within this BA process. The study will highlight areas that should be avoided in order to minimise potential impacts, and evaluate the project alternatives.

The Basic Assessment will aim to achieve the following:

- Provide an overall assessment of the social and biophysical environments of the affected area by the proposed construction of the project;
- Undertake a detailed assessment of the preferred route/s in terms of environmental criteria including the rating of significant impacts;
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive public participation process to ensure that I&AP issues and concerns are recorded and commented on.

## Why are environmental studies needed?

In terms of the **Environmental Impact Assessment** (EIA) **Regulations** Government Notice Regulation (GNR) No. 544 to 546 of 2010 (as amended), published in terms of Section 24(5), and read with Section 44, of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), **ACWA Power Solafrica Bokpoort CSP Power Plant (Pty) Ltd** requires **environmental authorisation** from the National Department of Environmental Affairs (DEA) for undertaking the proposed project as it includes activities listed under Regulation 544 of the NEMA EIA.

The following activities of GNR 544 of June 2010 have been applied for:

- Activity 9 The construction of facilities or infrastructure exceeding 1,000 metres in length for the bulk transportation of water (i) with a peak throughput of 120 litres per second or more.
- Activity 11 The construction of (x) infrastructure or structures covering 50 square metres or more, where such construction occurs within a watercourse or within 32 metres of a watercourse.
- Activity 18 The infilling or depositing of more than 5 m<sup>3</sup> into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 m<sup>3</sup> from (i) a watercourse.

The following activities of the GNR 546 of June 2010 have been applied for:

Activity 2 – The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.

(a) Northern Cape province:

iii. Outside urban areas, in:

(dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

Activity 4 – The construction of a road wider than 4 metres with a reserve less than 13.5 metres.

(a) Northern Cape province:

ii. Outside urban areas, in:

(aa) A protected area identified in terms of NEMPAA, excluding conservancies;

(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

Activity 16 – The construction of (iv) infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

(a) In the Northern Cape:

ii. Outside urban areas, in:

(aa) A protected area identified in terms of NEMPAA, excluding conservancies;

(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

Activities under these listings may have an effect on the environment, hence a BA process, as prescribed in Regulations 21 to 25 of the Environmental Impact Assessment Regulations (Regulation 543), will have to be undertaken. A Basic Assessment is an effective planning and decision-making tool, which allows for the identification of potential environmental consequences of a proposed project, and its management through the planning process.

**ACWA Power Solafrica Bokpoort CSP Power Plant (Pty) Ltd** has appointed **Royal HaskoningDHV** (RHDHV) as independent Environmental Assessment Practitioners (EAP) to undertake the required environmental studies.

As part of these environmental studies, all I&APs will be actively involved through a public participation process.

# **Public Participation Process**

It is important that relevant I&APs are identified and involved in the public participation process from the outset of the project. To ensure effective public participation, the process includes the following steps during the BA Process:

- **STEP 1**: Advertise the BA Process (local newspaper);
- **STEP 2:** Register I&APs and key stakeholders on the database (on-going);
- **STEP 3:** Consultation with, and transfer of information to, I&APs through consultation and stakeholder engagement;
- **STEP 4:** Invite I&AP comment and input on the draft BA report (40-day comment period); and
- STEP 5: Record all comments, issues and concerns raised by I&APs within an issues trail, which will form an integral part of BA Reports.

# How can you get involved?

# If you consider yourself an I&AP for this proposed project, we urge you to become involved.

- By responding (by phone, fax or e-mail) to our invitation for your involvement in the process;
- By completing the attached comment form and mailing or faxing it to Bjorn Hoffmann at RHDHV;
- In writing contacting consultants if you have a query, comment or require further project information; and
- By reviewing and commenting on the draft Basic Assessment Reports within the allowed 40-day review periods.

Please make use of the opportunities created by the public participation process to become involved in the process and provide comment. If you have issues and/or concerns which affect and/or interest you, please raise them. Or, if you would simply like more information, let us know.

# Your input into this process forms a key part of the environmental studies and we would like to hear from you to obtain your views on the proposed project.

By completing and submitting the accompanying response form, you automatically register yourself as an I&AP for this project, and ensure that your comments, concerns and/or queries raised regarding the project will be noted.

Comments and queries on the project can be directed to						
Mr Diern Heffmann	PO Box 5	5, Pinetown, 3600	-1			
мі Бјоті нопплаті	Tel	031 719 5571	Bourd			
	Fax	031 719 5505				
Royal HaskoningDHV	Email	bjorn.hoffmann@rhdhv.com	Enhancing Society Together			

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