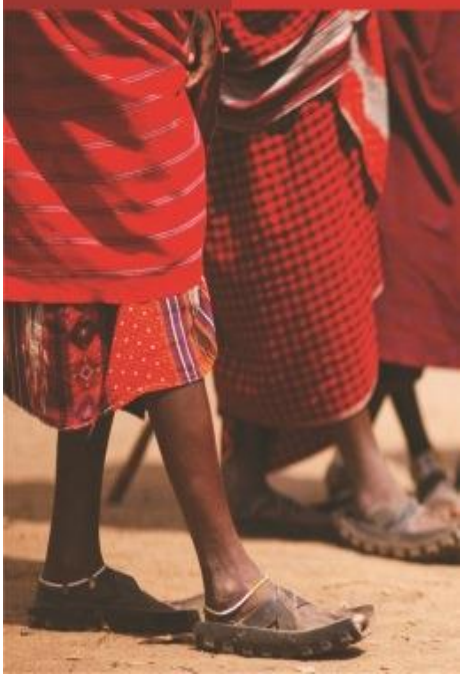

DIGBY WELLS
ENVIRONMENTAL

Environmental Authorisation and Integrated Water Use License Applications for the Proposed Active Water Treatment Plant at the Klipspruit Colliery, Mpumalanga Province

Social Impact Assessment

Project Number:

SOU5014

Prepared for:

South32 SA Coal Holdings (Pty) Ltd

July 2018

Digby Wells and Associates (South Africa) (Pty) Ltd
Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 069 6801, info@digbywells.com, www.digbywells.com

This document has been prepared by Digby Wells Environmental.

Report Type:	**Social Impact Assessment**
Project Name:	**Environmental Authorisation and Integrated Water Use License Applications for the Proposed Active Water Treatment Plant at the Klipspruit Colliery, Mpumalanga Province**
Project Code:	**SOU5014**

Name	Responsibility	Signature	Date
Nonka Byker	Author		27 July 2018
Jan Perold	Technical review		1 August 2018

EXECUTIVE SUMMARY

South32 SA Coal Holdings (Pty) Limited (hereafter South32) owns the Klipspruit Colliery (KPS), near Ogies in the Mpumalanga Province (refer to Figure 3-1 for the locality plan). Contaminated water that is being generated at KPS by mining activities exceeds the re-use capacity within the operations, whilst the storage capacity in mined out areas has reached its limits. The result of this is the risk of spillages or discharges to the natural environment. Effective management of this risk is essential to continued operations at KPS ensuring access to coal resources as well as securing and maintaining the requisite environmental licences and authorisations to operate and expand. Water treatment is thus required and South32 proposes to construct a modular Water Treatment Plant (WTP) and ancillary infrastructure to treat mine-affected water (the Project). South32 has appointed Digby Wells Environmental (Digby Wells) as the independent Environmental Assessment Practitioner to undertake the environmental-legal application processes and Specialist studies relevant to this proposed project.

The WTP is to be established within the operational area of the mine in the south-eastern corner of the Mining Right boundary, adjacent to KPS project offices. The proposed WTP will be modular in design and constructed in three phases, starting at a capacity of 2Ml/day, upgradeable to 3.3Ml/day and then increments of 3.3Ml/day to 10Ml/day. Contaminated water will be abstracted from the Balancing Dam at KPS and pumped to the WTP. After treatment, clean water that complies with the Resource Water Quality Objectives (RWQO) for the Wilge River catchment is proposed to be discharged into the Saalklapspruit at the northern boundary of the KPS operation adjacent to the N12 national highway.

The proposed WTP will be located in the south-eastern corner of the operational area of Klipspruit Colliery (KPS), close to the KPS project offices. KPS itself is located approximately 3km east of Ogies along the R555 where it intersects with the R545. The project site itself as well as Ogies (as the closest town) are located within Ward 30 of the Emalahleni Local Municipality (ELM). Phola lies approximately 4km north of KPS and is located partly in Wards 28, 30 and 31 of the ELM. The setting of KPS is depicted in Figure 3-1 below, whereas Figure 3-2 provides more detail on the location of the proposed project infrastructure (i.e. the balancing dam, the pipeline route and the location of the WTP).

This report details the results of the Social Impact Assessment (SIA) conducted as part of the EA process. Vanclay (2002) defines a social impact assessment as *"the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programmes, plans and projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment."*

The change processes that were assessed included the following:

- Geographic processes (processes that affect the land use of the local area): ***no impacts foreseen.***

- Demographical processes (the composition of the local community in terms of variables such as age, gender, race, language, etc.): ***no impacts foreseen***.
- Economic (the economic activities in the local society, including an assessment of peoples' livelihoods, and to a lesser extent, the macro-economic factors that affected the local community as a whole): ***no impacts foreseen***.
- Institution and Legal processes (the processes that affect service delivery to the local area: ***potential health impacts could result if untreated water is discharged into the catchment area.***
- Socio-cultural processes (the local culture of the area, i.e. the way in which the local community live): ***no impacts foreseen***.

The introduction of a WTP at KPS is viewed as socially beneficial to the surrounding socio-economic environment as it will enhance the quality of effluent that is discharged into the catchment system in compliance with the Saalklapspruit catchment RWQOs.

At the time of compiling the SIA report, little information was available on the potential for job creation during the construction phase of the project. It was therefore not possible to assess this change process in detail, but it is nonetheless recommended that any unskilled job opportunities be offered to community members from nearby Phola. This could include labour intensive activities such as sight clearance by hand, fencing off the construction area, etc. The use of local labour will be in support of the mine's intention of showing goodwill to neighbouring communities and, at the same time, reduce the risk for conflict between newcomers and residents (often local feel 'foreigners' take away their opportunities).

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 Introduction

Digby Wells Environmental (hereafter Digby Wells) has been appointed by South32 SA Coal Holdings (Pty) Ltd (hereafter South32) to facilitate and complete an integrated environmental regulatory applications process for authorisations required to install an active Water Treatment Plant (WTP) capable of treating mine affected water from the balancing dam at the Klipspruit (KPS) Colliery in Mpumalanga, South Africa Province.

2 Details of the Specialist

This Specialist Report has been compiled by the following specialists:

Table 2-1: Details of the Specialist(s) who prepared this Report

Responsibility	**Report Writer**
Full Name of Specialist	Nonka Byker
Highest Qualification	B.Psych.
Years of experience in specialist field	20
Responsibility	**Technical Review**
Full Name of Specialist	Jan Perold
Highest Qualification	PhD

2.1 Declaration of the Specialist

I, Nonka Byker, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent, other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity;
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the specialist

Nonka Byker

Full Name and Surname of the specialist

Digby Wells Environmental

Name of company

27 July 2018

Date

3 Project Description

South32 SA Coal Holdings (Pty) Limited (hereafter South32) owns the Klipspruit Colliery (KPS), near Ogies in the Mpumalanga Province (refer to Figure 3-1 for the locality plan). Contaminated water that is being generated at KPS by mining activities exceeds the re-use capacity within the operations, whilst the storage capacity in mined out areas has reached its limits. The result of this is the risk of spillages or discharges to the natural environment. Effective management of this risk is essential to continued operations at KPS ensuring access to coal resources as well as securing and maintaining the requisite environmental licences and authorisations to operate and expand. Water treatment is thus required and South32 proposes to construct a modular Water Treatment Plant (WTP) and ancillary infrastructure to treat mine-affected water (the Project). South32 has appointed Digby Wells Environmental (Digby Wells) as the independent Environmental Assessment Practitioner to undertake the environmental-legal application processes and Specialist studies relevant to this proposed project.

The WTP is to be established within the operational area of the mine in the south-eastern corner of the Mining Right boundary, adjacent to KPS project offices. The proposed WTP will be modular in design and constructed in three phases, starting at a capacity of 2Ml/day, upgradeable to 3.3Ml/day and then increments of 3.3Ml/day to 10Ml/day. Contaminated water will be abstracted from the Balancing Dam at KPS and pumped to the WTP. After treatment, clean water that complies with the Resource Water Quality Objectives (RWQO) for the Wilge River catchment is proposed to be discharged into the Saalklapspruit at the northern boundary of the KPS operation adjacent to the N12 national highway.

The treatment process will be based on the use of membrane desalination with brine softening and will consist of the following steps:

- Pre-treatment of the feed water using pH adjustment and disinfection to remove organics from the system that can cause fouling and scaling of the membranes;
- Removal of the dissolved metals by chemical oxidation followed by the removal of precipitates and suspended solids using flocculation and coagulation unit processes;
- Ultrafiltration (UF) will be used to remove fine particles from the feed water to the Reverse Osmosis (RO) unit processes. This is necessary to prevent fouling and scaling of the RO membranes; and
- Product water conditioning is required to ensure the pH meets the discharge requirements.

This process will produce gypsum sludge and brine. The gypsum sludge will be dewatered at the WTP and then loaded onto trucks for off-site disposal at a licenced waste management facility designed for this type of material. The brine will be recycled back into the treatment process until the salinity requires that a portion be depleted from the system. This small volume of brine will be stored in tanks within the proposed WTP footprint from where it will be pumped into road tankers and transported to a third-party waste management site licenced to receive this waste.

The infrastructure layout of the project is depicted in Figure 3-2 and the key infrastructure components of the project scope are as follows:

- A Feed Water Line comprising of a pump station and 1.5km High Density Poly Ethylene (HDPE) pipeline from the Balancing Dam to the WTP site capable of pumping 10Ml/day;
- A return water system from the WTP to the Balancing Dam along the same route as the Feed Water Line for the management of treated water that does not comply with the requirements for release to the catchment;
- A WTP Area with a footprint of approximately 1.5ha for the establishment and operation of a modular WTP with a maximum throughput of 10Ml/day. This includes the development and use of facilities for the storage and handling of hazardous chemicals used in the treatment process;
- A Discharge Line comprising of a 4km HDPE pipeline along the eastern boundary of KPS to transfer the treated water for discharge to the Saalklapspruit. Two pipeline routes are required to accommodate advancing mining and rehabilitation activities along the proposed pipeline servitude, and will be implemented at different stages of the project; and
- A dissipation structure at the proposed discharge point, alongside the N12 National Highway.

Supporting services such as the new powerline and change houses and ablution facilities (connected to KPS's existing sewage line) are also included in the project.

3.1 Project Location

The proposed WTP will be located in the south-eastern corner of the operational area of Klipspruit Colliery (KPS), close to the KPS project offices. KPS itself is located approximately 3km east of Ogies along the R555 where it intersects with the R545. The project site itself as well as Ogies (as the closest town) are located within Ward 30 of the Emalahleni Local Municipality (ELM). Phola lies approximately 4km north of KPS and is located partly in Wards 28, 30 and 31 of the ELM. The setting of KPS is depicted in Figure 3-1 below, whereas Figure 3-2 provides more detail on the location of the proposed project infrastructure (i.e. the balancing dam, the pipeline route and the location of the WTP).

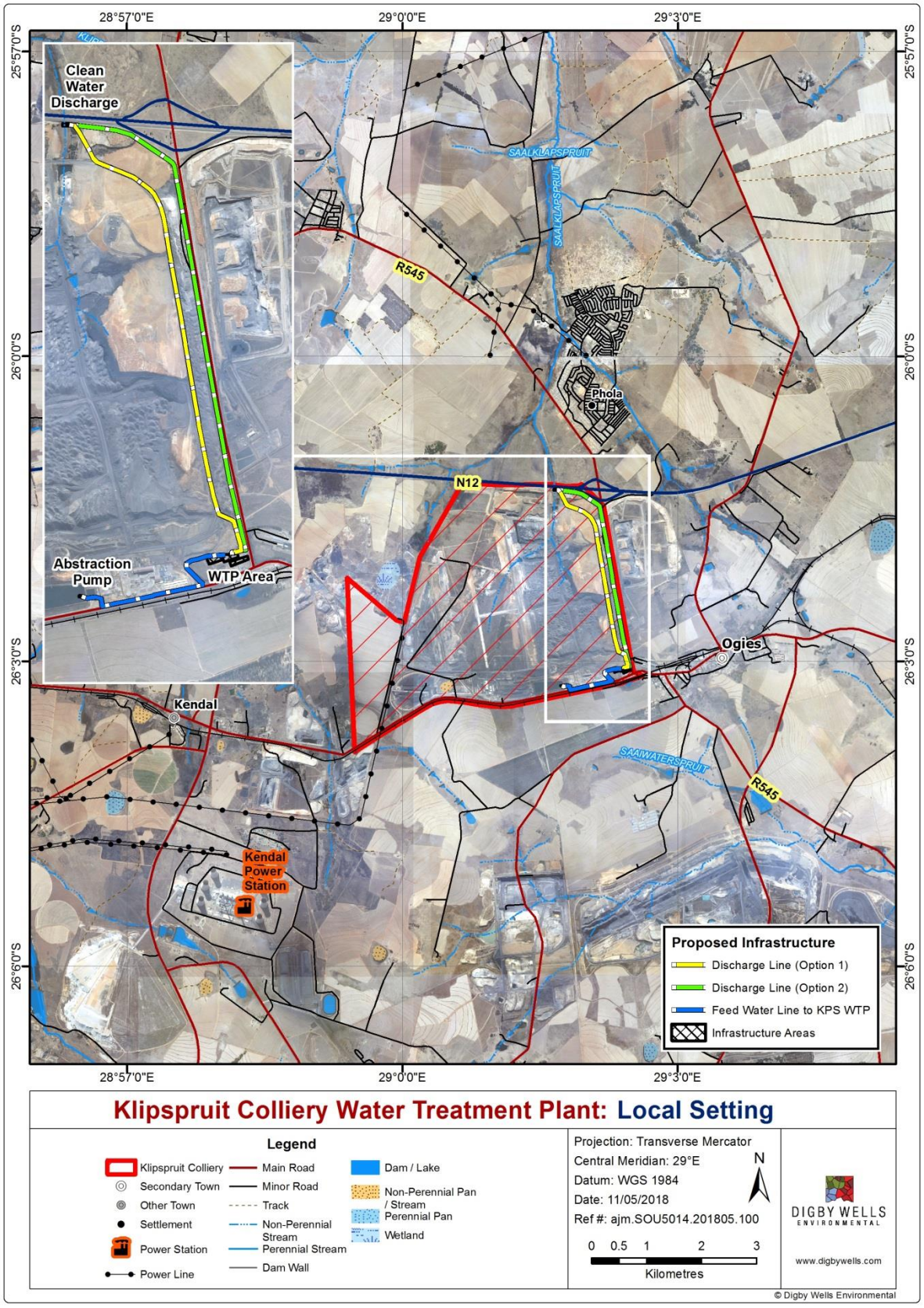

Figure 3-1: Local setting of the KPS colliery

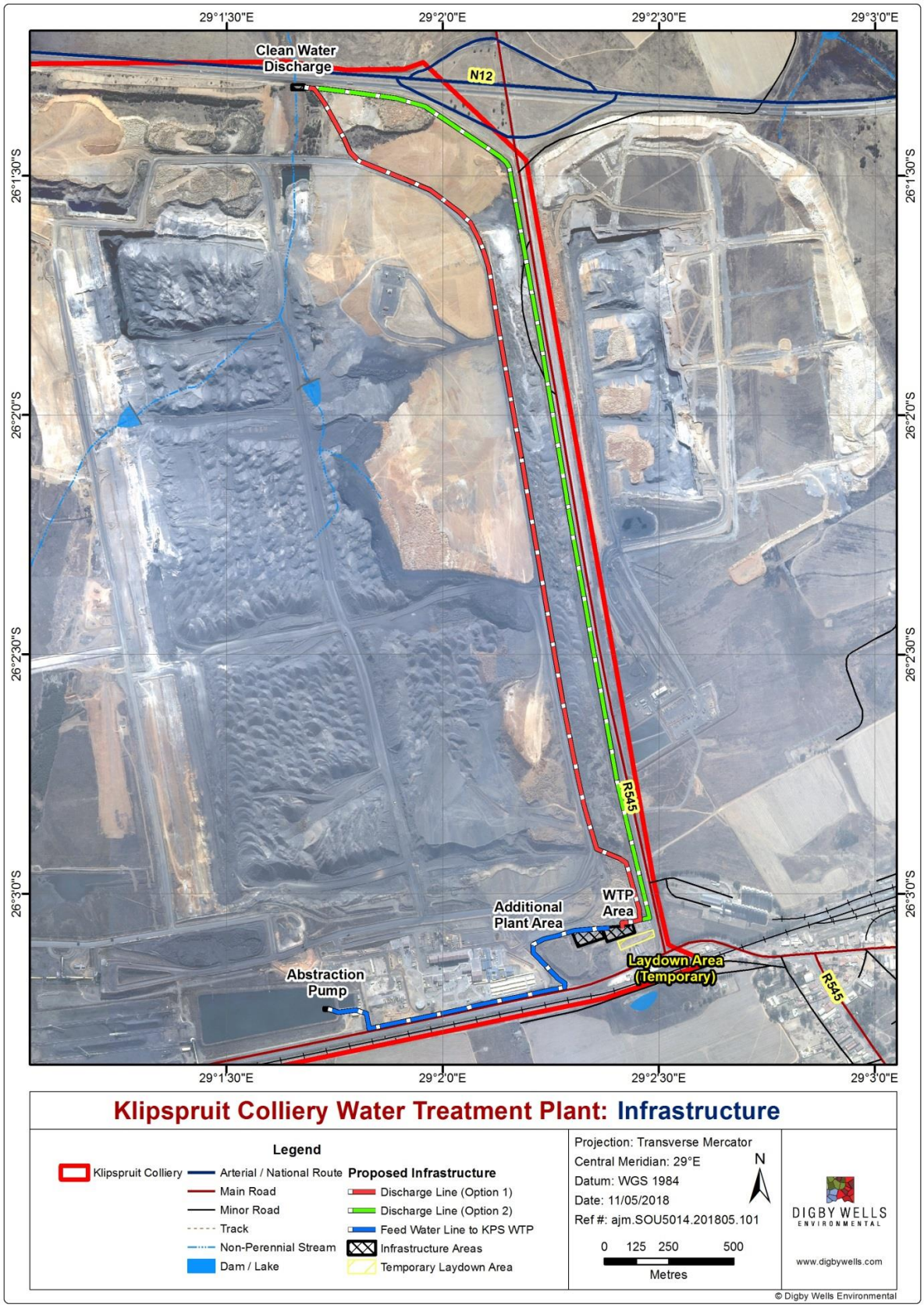

Figure 3-2: Infrastructure placement within the KPS Colliery

For South32 to install and operate the proposed WTP as well as subsequently discharge the treated mine affected water, the following authorisations must be obtained:

- Environmental Authorisation (EA) in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and associated regulations, including the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended); and
- Integrated Water Use License (IWUL) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

This report details the results of the Social Impact Assessment (SIA) conducted as part of the EA process. The SIA Report (SIAR) builds on the SIA Scoping Report (SIASR) that was compiled in April 2018.

3.2 Definition of a Social Impact Assessment

Vanclay (2002) defines a social impact assessment as *"the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programmes, plans and projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment."*

Social change processes, in turn, are *"set in motion by project activities or policies. They take place independently of the social context. Resettlement, for example, is a social change process, set in motion by, inter alia, the activity of land clearing… Depending on the characteristics of the local social setting and mitigation processes that are put in place, social change processes can lead to social impacts.* Furthermore, *"the way in which the social change processes are perceived, given meaning or value depend on the social context in which various societal groups act. Some sectors of society, or groups in society, are able to adapt quickly and exploit the opportunities of a new situation. Others (e.g. vulnerable groups) are less able to adapt and will bear most of the negative consequences of change. Social impacts, therefore, are implicitly context-dependent."*

3.3 Objectives of the Study

In light of the definition of an SIA, the overall objective of the SIA was to identify social change process and assess the social impacts likely to stem from the social change processes as a result of the construction and operation of the proposed WTP. In support of the overall objective, a number of secondary objectives were identified, namely:

- Undertake the detailed studies that were identified during the scoping phase, thereby refining the assessment of preliminary impacts on the social environment;

- Describe the expected social change processes likely to be brought about by the proposed WTP, and assess the social impacts associated with each of these change processes by utilising a significance rating scale;
- Based on the intensity of the impact, identify and describe mitigation measures that serve to either prevent or minimise the effect of negative impacts, and enhancement measures that serve to maximise positive impacts; and
- Based on the results of the impact assessment, make specific recommendations on the way forward given the social impacts associated with each phase of the proposed WTP.

3.4 Summary of the SIA Scoping Report (SR) findings

The overall objective of the Scoping Phase (completed in April 2018) was to identify issues and concerns in order to focus the detailed assessment to follow in the impact assessment phase (current phase), and to provide a framework within which the assessment is to be undertaken. A summary of the change processes that were assessed during the SIASR are listed in Table 3-1 below.

Table 3-1: Summary of findings in the SIASR

Process	Brief Description	Expected Impacts
Demographic	Demographic processes relate to the number of people and composition of a community and include an overview of the population size and the educational profile of the affected communities. It is possible that the Project could lead to an influx of certain population segments, e.g. migratory construction workers and job seekers.	An influx of 'strangers' to the area could temporarily change the composition of the local community and cause economic, health, safety and social well-being impacts.
Geographic	Geographical processes relate to land use patterns and infrastructure in the area and describes the land use in the study area from a social perspective. The proposed WTP and associated infrastructure are located within the operational area of the KPS and therefore no change to the land use is expected.	None.
Economic	Economic processes relate to the way in which people make a living and the economic activities within that society. A marginal increase in job opportunities could be expected during the construction phase.	The availability of job opportunities could have a temporary economic impact during the construction phase.
Institutional and Empowerment	Institutional and empowerment processes relate to the role, efficiency and operation of government sectors and other organisations	Non-implementation of the project could potentially lead to health impacts in

Process	Brief Description	Expected Impacts
	within the area. It also relates to people's ability to become involved in and influence the decision making process.	the immediate area as well as other downstream areas.
Socio-Cultural	Socio-cultural processes relate to the way in which humans behave, interact and relate to each other and their environment, as well as the belief and value systems that guide these interactions. As the WTP and associated infrastructure is located within an operational colliery, it is not expected that this addition would change the socio-cultural landscape of the area.	None.

3.5 Assumptions and Limitations of Study

The list provided below describes the assumptions and the limitations applicable to this study:

- The sources consulted are not exhaustive, and additional information that might strengthen arguments or contradict information in this report and/or identify additional information might exist;
- The specialist endeavoured to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to the assessment;
- It was assumed that the motivation for, and the ensuing planning and feasibility studies of the Project were done with integrity, and that the information provided to date by the project proponent, the independent environmental assessment practitioner and the public participation consultant is accurate;
- At the time of the study, certain Project information was not available and was therefore excluded from the detailed assessment. This relates to the availability of job opportunities during the construction and operational phases, the skills levels required and the possibility of the mine utilising local labour;
- The WTP components will be constructed off-site and then transported to site for assembly. It was therefore assumed that job opportunities will be limited, but certain suggestions were made for the utilisation of local labour for unskilled tasks on site.
- A traffic assessment was not required for this Project and therefore the SIA did not consider any impacts related to an increase in construction / abnormal traffic to site or the impact this could have on local road users.

4 Approach and Methodology

4.1 Data Collection

It was not considered necessary to conduct specialist social fieldwork specifically for this project as Digby Wells had already undertaken numerous other studies in the area and for KPS specifically (e.g. the KPS South Extension Project (2014) and the KPS Extension: Weltevreden Project (2015)). These previous SIAs had already established a solid knowledge base regarding local socio-economic conditions and the ways in which these are likely to be affected by new developments.

4.2 Desktop Review

To determine the current socio-economic conditions in the study area, a desktop review of the following secondary data was undertaken:

- Reworked census (2011) and community survey (2016) data (StatsSA) to fit the context of the new municipal ward boundaries of 2016 (using Wazimap);
- The Emalahleni Local Municipality's Integrated Development Plan (IDP) (2017-2022);
- The Emalahleni Local Municipality's Spatial Development Framework (SDF) (2015);
- The surface water assessment scoping report (Digby Wells, 2018);
- The groundwater impact assessment report (Digby Wells, 2018);
- The SIA that was prepared for the KPS Extension: Weltevreden Project (Digby Wells, 2015); and
- The comments and responses reports compiled as part of the Weltevreden and KPS South extension projects.

4.3 Information from the public consultation process

This section will be updated after the public consultation period has been finalised, and if any comments pertaining to Social issues in particular are raised by the public.

4.4 Compilation of a baseline social profile

A social baseline profile was compiled using secondary data. The baseline profile was included in the SIASR and focused on the site-specific, local and regional study areas. The baseline profile considered the following change processes:

- Geographic: the processes that affect the land use of the local area;
- Demographic: the composition of the local community in terms of variables such as age, gender, race, language, etc.;

- Economic: the economic activities in the local society, including an assessment of peoples' livelihoods, and to a lesser extent, the macro-economic factors that affected the local community as a whole;
- Institution and Legal: the processes that affect service delivery to the local area; and
- Socio-cultural: the local culture of the area, i.e. the way in which the local community live and interact with one another.

4.5 Impact Assessment Methodology

Impacts and risks have been identified based on a description of the activities to be undertaken. Once impacts have been identified, a numerical environmental significance rating process will be undertaken that utilises the probability of an event occurring and the severity of the impact as factors to determine the significance of a particular environmental impact.

The severity of an impact is determined by taking the spatial extent, the duration, and the severity of the impacts into consideration. The probability of an impact is then determined by the frequency at which the activity takes place or is likely to take place and by how often the type of impact in question has taken place in similar circumstances.

Following the identification and significance ratings of potential impacts, mitigation and management measures will be incorporated into the EMPr.

Details of the impact assessment methodology used to determine the significance of physical, bio-physical, and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = CONSEQUENCE X PROBABILITY X NATURE

Where

Consequence = intensity + extent + duration

And

Probability = likelihood of an impact occurring

And

Nature = positive (+1) or negative (-1) impact

The matrix calculates the rating out of 147, whereby intensity, extent, duration and probability are each rated out of seven as indicated in Table 4-2. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation has been applied; post-mitigation is referred to as the residual impact. The significance of an impact is determined and categorised into one of seven categories (The descriptions of the significance ratings are presented in Table 4-3).

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, (i.e., there may already be some mitigation included in the engineering design). If the specialist determines the potential impact is still too high, additional mitigation measures are proposed.

Table 4-1: Impact Assessment Parameter Ratings

Rating	Intensity/ Irreplaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
7	Irreplaceable loss or damage to biological or physical resources or **highly** sensitive environments. Irreplaceable damage to **highly sensitive** cultural/social resources.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the project.	Definite: There are sound scientific reasons to expect that the impact will definitely occur. >80% probability.
6	Irreplaceable loss or damage to biological or physical resources or **moderate to highly** sensitive environments. Irreplaceable damage to cultural/social resources of **moderate to highly** sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond project life: The impact will remain for some time after the life of the project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur.>65 but <80% probability.

Rating	Intensity/ Irreplaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
5	Serious loss and/or damage to physical or biological resources or **highly** sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/ Region Will affect the entire province or region	Project Life (>15 years): The impact will cease after the operational life span of the project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.
4	Serious loss and/or damage to physical or biological resources or **moderately** sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures / items of cultural significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.

Rating	Intensity/ Irreplaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
3	Moderate loss and/or damage to biological or physical resources of **low to moderately** sensitive environments and, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	Local Local including the site and its immediate surrounding area.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur. <25% probability.
2	**Minor loss and/or effects** to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experience by a small percentage of the baseline.	Limited Limited extending only as far as the development site area.	Short term: Less than 1 year and is reversible.	Rare / improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate mitigation measures. <10% probability.

Rating	Intensity/ Irreplaceability		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
1	**Minimal to no loss** and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to commonplace structures.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very limited/Isolated Limited to specific isolated parts of th site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely / None: Expected never to happen. <1% probability.

Table 4-2: Probability/Consequence Matrix

Significance																																					
-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Consequence

Table 4-3: Significance rating description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change	Major (positive) (+)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive) (+)
36 to 72	A positive impact. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive) (+)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive) (+)
-3 to -35	An acceptable negative impact for which mitigation is desirable. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative) (-)
-36 to -72	A minor negative impact requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative) (-)
-73 to -108	A moderate negative impact may prevent the implementation of the project. These impacts would be considered as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe changes.	Moderate (negative) (-)
-109 to -147	A major negative impact may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative) (-)

4.6 Mitigation measures

Appropriate mitigation/enhancement measures are recommended to avoid or minimise any negative social impacts or to maximise any positive social impacts.

5 Social Change Processes and Impact Assessment

The following section proceeds to discuss the various change processes and related expected impacts that could be expected as a result of the Project being introduced into the socio-economic environment. A change process can be defined as modification that takes place within the receiving environment because of a direct or indirect Project intervention. A potential impact follows because of the change process, e.g. an influx of construction workers to a Project area (i.e. a change process) can lead to a feeling of unease and fear (i.e. an impact) amongst local residents who associate the presence of construction workers with an increase in crime. A change process can only result in an impact once it is experienced as such by an individual/community on a physical and/or cognitive level.

The change processes that were assessed included the following:

- Geographic processes refer to the processes that affect the land use of the local area.
- Demographical processes refer to the composition of the local community in terms of variables such as age, gender, race, language, etc.
- Economic processes refer to the economic activities in the local society, including an assessment of peoples' livelihoods, and to a lesser extent, the macro-economic factors that affected the local community as a whole.
- Institution and Legal processes refer to the processes that affect service delivery to the local area.
- Socio-cultural processes refer to the local culture of the area, i.e. the way in which the local community live.

This section has been structured as follows:

- A brief discussion of the baseline processes (without the Project);
- A detailed discussion of the expected change processes as a result of the Project, including the circumstances that will lead to such a change process taking place;
- An assessment of the potential impacts as a result of the Project prior to mitigation;
- Determining the significance of the impact before mitigation;
- Propose mitigation measures;
- A re-assessment of the significance of impacts, assuming successful implementation of the mitigation measures;
- A brief discussion of cumulative impacts, if any; and

- A brief discussion of residual impacts, if any.

To meet the overall objective of the study, it was necessary to compile a detailed description of the study area. This detailed social baseline profile has been included in the SIASR and therefore the first segment of each subsection below provides only a brief summary of the baseline profile of the social processes in terms of geographical, demographic, economic, institutional, socio-cultural and biophysical conditions in the study area. This is followed by an assessment of the potential impacts with the implementation of the Project.

5.1 Geographical Processes

Geographical processes relate to land use patterns and infrastructure in the area. This section therefore describes the land use in the study area from a social perspective, specifically in terms of settlement patterns and land use developments.

5.1.1 Land Use within the Primary Study Area

The predominant land use around the Project area is reflected in Figure 5-1 below. From this map it is evident that the Project area is surrounded by mining infrastructure within the KPS colliery footprint, with some cultivated fields and grassland to the north and south. The closest human settlement is the town of Ogies, located along the R555, some 600m to the east of the KPS Colliery and the WTW site. Phola is located approximately 4.5km north of the site, along the R545.

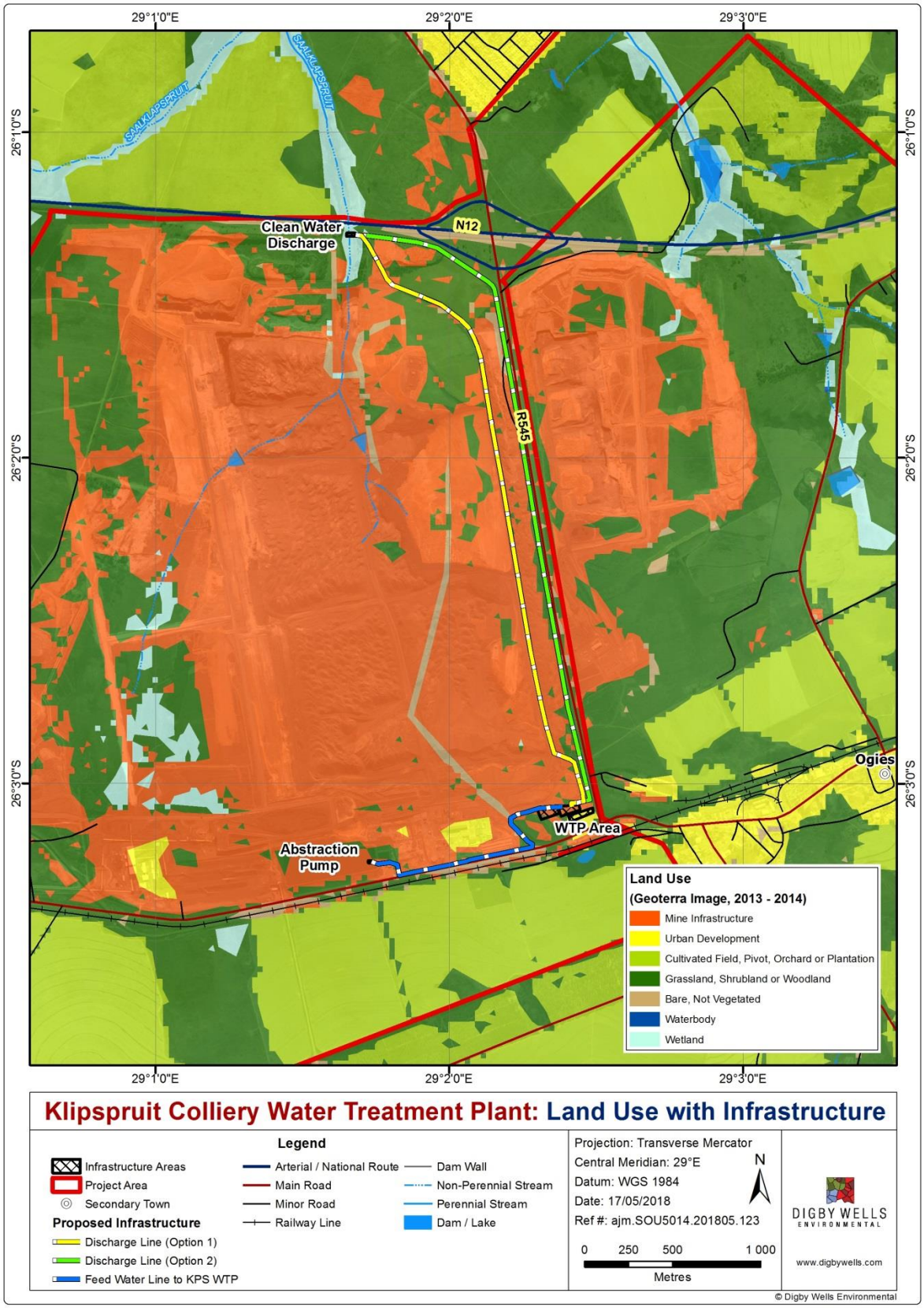

Figure 5-1: Land Use Surrounding the Project Infrastructure

5.1.2 Geographic Change Processes and Expected Impacts

Geographical change processes refer to changes in land use, whether it is on a temporary or permanent basis. As per the results of the SIASR (see Table 3-1), it is not expected that the construction and operation of the WTP and pipelines will lead to a change in land use, as these tanks will be located within the footprint of the operational area of KPS (i.e. although the land use will change within the mine's footprint, it is not expected to affect the land use of people around the mine). ***No social impacts are foreseen as a result of land use changes.***

5.2 Demographical Processes

Demographical processes refers to the composition of the local population and considers variables such as population size, growth and density, gender, age, household sizes and spatial distribution of the population. As indicted previously, the Project will be located in the mine's existing footprint (i.e. a brown-fields area), and therefore the primary area of impact is defined as Ward 30 of the ELM (the ward in which the mine is situated).

5.2.1 Current demographical profile

A detailed socio-demographic profile was included as part of the SIASR. From this profile it was evident that there is an almost equal split between males and females, with males dominating slightly at 55.1%. In 2011, Ward 30 had a total population of 13,617 people. The population density within the ward stood at approximately 53 people per km^2 in 2011. The population is made up of predominantly Black African (95.7%), mostly (around 70%) in the working age interval (aged 15 to 64).

5.2.2 Demographic Change Processes and Expected Impacts

Although the SIASR found that it would be possible that the Project could lead to an influx of certain population segments, e.g. migratory construction workers and job seekers, it has since been confirmed by South32 that most of the Project components will be assembled off-site, after which it will be transported to site for assembly. Because there won't be large-scale construction activities on site, and because of the overall small scale of the Project, it is not expected that the Project will draw the attention of job seekers from further afield than Phola (i.e. no in-migration of job-seekers expected). The size of the assembly team will be minimal and therefore it is expected that their presence on-site during the day will be insignificant. Therefore, ***no further social impacts are foreseen in terms of demographical change processes.***

5.3 Economic Processes

The economic baseline profile looks at the way in which people make a living and the economic activities in the area. It typically considers variables such as employment rates, employment sectors, and the education profile of the community.

5.3.1 Current economic profile

Emalahleni has an overall employment rate of 69,2% whereas the primary study area (Ward 30) averages at 60,2%. Despite these high employment rates, the unemployment rate – including discouraged work-seekers – averages at around a third of the overall population, which is still considered to be a fairly high unemployment rate. Most households (close on a half, 40,3%) are considered middle-class (defined as ≤ R 76 000 per annum). Mining is still the largest economic contributor the district's and the province's Gross Value Add (GVA).

5.3.2 Economic Change Processes and Expected Impacts

Economic change processes relate to the changes brought about to the employment and general economic profile of the area because of the introduction of the Project. Employment creates a source of income, which in turn enables the employed individual to access services and a support mechanism for his/her family, thereby enhancing not only the individual's quality of life, but also that of his/her household. Contrary to the findings of the SIASR that predicted a marginal increase in job opportunities, it is not foreseen that the construction and operation of the WTP and associated infrastructure ***would have any significant social impacts*** as it would not alter the economic profile of the study area, i.e. no significant employment opportunities are associated with the Project.

5.4 Empowerment and Institutional Processes

Empowerment and Institutional processes relate to the role, efficiency and operation of government sectors and other organisations within the area in terms of service delivery. To determine the extent that people would want to engage in the project processes (e.g. public participation) and influence how decisions are made that would concern them.

5.4.1 Empowerment and Institutional Change Processes and Expected Impacts

South32 intends to treat mine affected water to comply with the Resource Water Quality Objectives (RWQOs) of the Saalklapspruit catchment via a 4 km long clean water HPDE pipeline to a discharge point adjacent to the N12 road. Bearing this in mind, it is foreseen that the implementation of the proposed project would potentially have a positive impact on the receiving environment and that non-implementation could potentially have negative impacts.

Resource Quality Objectives (RQOs) are defined in the National Water Act as *"clear goals relating to the quality of the relevant water sources."* In view of this definition, RQOs were developed that are numerical and narrative descriptors of quality, quantity, habitat and biotic conditions that must be met to achieve a certain management scenario. The RWQOs in turn are the water quality components of the RQOs. They are numeric or descriptive water quality objectives but provide more detail (spatial or temporal) than RQOs to guide the management requirements of the water quality of a specific water resource. In this regard, "*RWQOs outline water user compliance requirements with respect to water quality, as well as their*

needs with respect to the disposal of water containing waste to the resource and the aquatic ecosystem requirements." (Training manual for RWQOs model, DWAF, 2007).

RWQOs for any water resource are determined based on 'acceptable risk', i.e. the less risk acceptable for damaging a specific water resource, the more stringent the objectives. A higher risk might be acceptable for short-term utilisation of the water source, in which case the RWQOs would be less stringent bearing in mind that the long-term sustainable use of the resource is then compromised.

The Surface Water Impact Assessment Report that was compiled as part of the EIA for the Klipspruit Extension: Weltevreden Project (Digby Wells, 2015) reported that the impacts of existing activities at KPS to surface water quality was evident in the two streams draining on the site, namely the Grootspruit and the Saalklapspruit. The report found that, with the development of mining in these upstream catchments of the Wilge River, it was expected that more pollution emanating from additional mining activities (through the various expansion projects at the colliery), could add onto pollutants stream in the catchment if no mitigation measures were in place. The proposed WTP is one such mitigation measure as it will be used to manage the water emanating from dewatering activities from active mining areas and other voids where water accumulates.

Table 5-1: Empowerment and Institutional impact rating

IMPACT DESCRIPTION: Water Treatment				
Predicted for project phase:	**Pre-Construction**	**Construction**	**Operation**	**Decommissioning**
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION (Assesses the 'no go' option, i.e. mining activities continue without water treatment and untreated water is discharged into the catchment area)				
Duration	Beyond Project life (6)	Dewatering activities form part of mining activities. It is expected that untreated water will continue to contaminate water systems after mine closure.	Consequence: -6	Significance: Moderate negative (-68)
Extent	Province / region (5)	Saalklapspruit drains onto the site but forms part of upstream catchments of the Wilge River that extends beyond the municipal area.		
Intensity * type of impact	Very serious widespread social impacts. Irreparable	Contaminated water that filters into surface and groundwater can		

IMPACT DESCRIPTION: Water Treatment				
Predicted for project phase:	**Pre-Construction**	**Construction**	**Operation**	**Decommissioning**
Dimension	**Rating**	**Motivation**		
	damage to highly valued systems (-5)	cause health impacts when nearby communities use the water from streams. Households from Phola might be at risk due to the presence of informal settlements and lack of access to municipal services.		
Probability	Probable (4)			
MITIGATION: • The construction and operation of the WTP and associated pipelines must be done in compliance with the Saalklipspruit RWQOs, which is the rationale for the Project.				
POST-MITIGATION				
Duration	Beyond Project life (5)	The WTP will continue to operate post mine closure as part of decommissioning activities.	Consequence: +20	Significance: Moderate positive (80)
Extent	Province / region (5)	Treated water is released into the catchment area that flows wider than the municipal area.		
Intensity * type of impact	Great improvement to living standards of a large percentage of the local population (6)	Treated water is released into the system that can be re-used. Although it might not be potable, the risk of severe health impacts has been negated.		
Probability	Probable (4)			

5.5 Socio-Cultural Processes

Socio-cultural processes relate to the way in which humans behave, interact and relate to each other and their environment, as well as the belief and value systems which guide these interactions.

5.5.1 Socio-Cultural Change Processes and Expected Impacts

Socio-cultural change processes that are associated with the construction and operation of the Project include changes to aspects such as health and safety and sense of place. However, it is not expected that the Project would impact on sense of place, as the WTP and associated infrastructure would be located within the operational area of the KPS mine boundary (i.e. in proximity to infrastructure of a similar nature). The potential impact on health is only expected in the event that the project is not implemented, as discussed in Section 5.4 and assessed in Table 5-1 above.

6 Conclusions and Recommendations

The introduction of a WTP at KPS is viewed as socially beneficial to the surrounding socio-economic environment as it will enhance the quality of effluent that is discharged into the catchment system in compliance with the Saalklapspruit catchment RWQOs.

At the time of compiling the SIA report, little information was available on the potential for job creation during the construction phase of the project. It was therefore not possible to assess this change process in detail, but it is nonetheless recommended that any unskilled job opportunities be offered to community members from nearby Phola. This could include labour intensive activities such as sight clearance by hand, fencing off the construction area, etc. The use of local labour will be in support of the mine's intention of showing goodwill to neighbouring communities and, at the same time, reduce the risk for conflict between newcomers and residents (often local feel 'foreigners' take away their opportunities).

7 Bibliography

Digby Wells, 2015. *Environmental Authorisation for the KPSX: Weltevreden Project, Mpumalanga Province. Social Impact Assessment Report.*

Digby Wells, 2018. *Groundwater assessment for the proposed active Water Treatment Plant at South32 Klipspruit Colliery, Mpumalanga Province. Groundwater Report.*

Digby Wells, 2018. *South32 Klipspruit Water Treatment Plant. Surface Water Assessment Scoping Report.*

ELM. (2017). *Final Integrated Development Plan: 2017/8 - 2021/2.* Emalahleni: Emalahleni Local Municipality (Mpumalanga).

NDM. (2017). *Nkangala District Municipality Final Integrated Development Plan: 2017/18 - 2021/2022.* Middleburg: Nkangala District Municipality.

Open Up. (2017, May 12). *Wazimap updated with 2016 Municipal Election Results and new municipalities*. Retrieved April 20, 2018, from Open Up: https://openup.org.za/articles/wazimap-2016-update.html

Statistics South Africa. (2011). *Statistics by Place*. Retrieved April 20, 2018, from http://www.statssa.gov.za/?page_id=964

Wazimap. (2017). *Wazimap*. Retrieved April 20, 2018, from Profiles: Province North West: https://wazimap.co.za/