



GREEN DOOR **environmental**

DRAFT BASIC ASSESSMENT

The Proposed Establishment of the 245 ha Nsuze Irrigation Scheme (Non-Sensitive Areas) located on Reserve No. 19 of the Farm No. 15389, near Kranskop, KwaZulu Natal

NEAS Ref: DEA/EIA/0001676/2013

DEA Ref: 14/12/16/3/3/2/462

PREPARED FOR THE DEPARTMENT OF RURAL DEVELOPMENT AND LAND REFORM

16 September 2013



*Residential
Commercial
Industrial
Agriculture
Linear
Service*

Postal: PO Box 11 Hilton, 3245

Physical: Block H, Quarry Office Park, 400 Old Howick Road, Hilton, 3245

Phone: 033 343 4176 **Fax:** 033 343 4201

Cell: 072 181 4236

Email: rebecca@greendoorgroup.co.za

Website: www.greendoorgroup.co.za

BASIC ASSESSMENT REPORT



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

DEA Ref: 14/12/16/3/3/2/892

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998(Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 September 2012**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.

BASIC ASSESSMENT REPORT

15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES

If YES, please complete the formentitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECTDESCRIPTION

a) Describe the project associated with the listed activities applied for

Application has been made to the National Department of Environment Affairs (DEA) for the proposed establishment of the Nsuze Irrigation Scheme (Non-Sensitive Areas) located on Reserve No. 19 of the Farm No. 15389, near Kranskop, KwaZulu Natal. This application is for 245ha of irrigation and the establishment of 19 pump station and 10 reservoirs.

The Department of Rural Development and Land Reform (DRDLR) currently has five Development Programmes, one of which is the Comprehensive Rural Development Programme (CRDP). The purpose of the Programme is to provide support that leads to sustainable, equitable and vibrant rural communities. This CRDP incorporates two of the DRDLR strategic objectives, namely:

- To reach all the poorest rural wards in all rural municipalities; and
- To establish food gardens.

The programme incorporates 23 South-African District Municipalities which represent the poorest rural wards in all rural Municipalities. The Uthungulu District Municipality is amongst the nine Districts selected from within the Province of KwaZulu-Natal. The Nsuze Irrigation Scheme is located within the Nkandla Local Municipality. The project site is approximately 25km north-east of Kranskop and extends along the banks of the Tugela and Nsuze Rivers. This project aims to unlock the irrigation potential of the rivers to promote food production. The project consists of a total of 22 scattered plots which comprise a mix of cultivated and uncultivated lands, ranging from between two (2ha) and 34ha in size.

Agricultural Potential Assessments were undertaken for the project area. Areas of low agricultural potential have been excluded from the project area. The occurrence of rockiness and slope place restrictions on annual crops. Cultivation management will address soil permeability through the management of soil water content, fertiliser application and soil conservation practices.

Further Specialist Assessments have been undertaken for the project area. The Specialist Reports, attached in Appendix D, have identified sensitive areas relating to Biodiversity (Appendix D1), Freshwater Ecosystems (Appendix D2) and Heritage (Appendix D3). The plots have therefore been separated into non-sensitive and sensitive.

The DEA has confirmed that two separate Basic Assessment Applications can be made; one that incorporates the sensitive areas and one which assesses the non-sensitive areas. Each Basic Assessment Application provides generic information on the project and surrounding area, along with site specific information on the individual areas proposed to be irrigated.

This Basic Assessment is for the 16 non-sensitive sites, which total 245 ha. The plots are listed in Table 1 are shown in Appendix A and C. The boundaries of the sites have been informed by the Specialist Studies, and all sensitive areas have been excluded. The table below provides details on the sensitivities that were excluded for each plot.

BASIC ASSESSMENT REPORT

Table 1: Nsuze Irrigation Scheme - non-sensitive sites

No.	Plot No.	GPS	ha	Sensitivities in the area with buffer zones applied
1	1	28°52'5.27"S 31° 2'50.78"E	19.35	<ul style="list-style-type: none"> • Recommended watercourse buffers of 50m respected • Ecological corridor excluded • Recommended heritage buffer of 100m applied
2	5	28°50'49.29"S 31° 3'20.28"E	14.94	<ul style="list-style-type: none"> • Recommended watercourse buffer of 50m respected
3	6	28°50'33.72"S 31° 3'33.43"E	4.07	<ul style="list-style-type: none"> • Dense riverine woodland excluded
4	7	28°50'19.63"S 31° 4'8.15"E	13.41	<ul style="list-style-type: none"> • No sensitive areas to avoid
5	8	28°50'13.93"S 31° 4'23.80"E	13.27	<ul style="list-style-type: none"> • No sensitive areas to avoid
6	9	28°50'9.64"S 31° 4'37.01"E	1.7	<ul style="list-style-type: none"> • No sensitive areas to avoid
7	10	28°49'56.37"S 31° 4'47.47"E	4.59	<ul style="list-style-type: none"> • No sensitive areas to avoid
8	11	28°49'39.79"S 31° 4'59.78"E	19.74	<ul style="list-style-type: none"> • No sensitive areas to avoid
9	12	28°49'19.66"S 31° 4'55.59"E	8.45	<ul style="list-style-type: none"> • Areas of threatened plant species excluded
10	13	28°49'3.93"S 31° 4'25.97"E	7.6	<ul style="list-style-type: none"> • Areas of threatened plant species excluded
11	16	28°48'36.06"S 31° 5'22.73"E	14.38	<ul style="list-style-type: none"> • Erosion areas excluded • Recommended stream buffer of 50m respected
12	17	28°48'19.23"S 31° 5'2.94"E	22.75	<ul style="list-style-type: none"> • No sensitive areas to avoid
13	18	28°48'10.93"S 31° 4'34.15"E	32.65	<ul style="list-style-type: none"> • No sensitive areas to avoid
14	28	28°53'33.64"S 31° 1'54.00"E	12.39	<ul style="list-style-type: none"> • Heritage buffer of 100m respected • Recommended drainage channel buffer of 50m respected
15	29	28°51'2.54"S 31° 0'10.93"E	34.9	<ul style="list-style-type: none"> • Drainage channel areas excluded • Homestead excluded
16	31	28°49'16.66"S 30°58'53.64"E	21.1	<ul style="list-style-type: none"> • Drainage channel areas excluded • Steep slopes and area of sheet erosion excluded • Heritage buffer of 100m respected

Total 245.29

The Tugela and Nsuze rivers have been identified as National Freshwater Ecosystem Priority Areas (NFEPAs). To retain the free-flowing integrity of the Rivers, freshwater ecosystems that drain into the Rivers are required to be functionally maintained so as to avoid cumulative effects downstream. The sites identified above in Table 1 are located on the banks of the Nsuze and the Tugela Rivers.

The occurrence of steep slopes, intense rainfall in the rainy season, historical agricultural practices and soil that is prone to erosion combine to create a significant soil erosion issue for the catchment (It must be noted that irrigation of the soils do not increase their risk of erosion if managed correctly). Flooding events currently contribute to high sediment loads and major depositional features within the river courses.

A Water Resources Assessment (contained in Appendix D4) was undertaken for this project and it was concluded that there is adequate water supply from the Tugela and Nsuze to meet the proposed irrigation demand.

Potential impacts to the freshwater ecosystems through the cultivation of these plots could include:

- The risk of foreign materials being introduced;
- The risk of pollutants such as agricultural pesticides and fertilisers being introduced;
- The risk of soil disturbance and soil compaction;
- The risk of increased surface run-off from vegetation loss; and

BASIC ASSESSMENT REPORT

- The risk of increased erosion from unprotected soils.

Recommendations have been made by the Specialists to maintain the ecological integrity of the area. These include adherence to buffer zones, the control of run-off within the plots and the rehabilitation and management of the riparian habitat.

Proposed Infrastructure for plot irrigation:

Abstraction and storage

The high silt content of the Tugela has necessitated the proposal for separate pump sets for abstraction and conveyance. Thus abstraction pumps located at the riverside (within the buffer zone) will pump water to booster pumps (outside of the buffer zone) which will be located nearby, away from the River. The booster pumps will in turn transfer water to reservoirs (outside of the buffer zone). Dragline irrigation systems are proposed to irrigate the crops from the reservoirs on demand. The infrastructure is as follows:

- Ten submerged abstraction pump stations each with a footprint of 6.3 m² and installed with a centrifugal sump pump set;
- Nine booster pump stations each with a footprint of 17.2m² and installed with a centrifugal pump set;
- Eleven steel panel reservoirs with a range of holding capacity between approximately 600m³ and 2000m³; and
- Dragline sprinkler system comprising a bulk supply main with buried laterals. Connected to the laterals, by 25 m -36 m lengths of dragline hose, are sprinkler nozzles mounted on stands.

Electricity will be extended from existing three phase overhead power lines except where diesel powered pump sets are required to combat long distances which are unfeasible for electrical infrastructure. The positions of the river abstraction pump stations are provided in Table 2 below along with the corresponding booster pumps station, water reservoirs and plots serviced.

Table 2: Nsuze Irrigation Scheme –pump stations

No.	River Abstraction	GPS	Booster pump station	Water reservoir	Plots serviced
1	RA1	28°52'52.03"S 31° 2'18.76"E	BPS1	A,B	1,28
2	RA2	28°50'35.40"S 31° 3'25.26"E	BPS2	C	5
3	RA3	28°49'24.13"S 31° 4'25.68"E	BPS3	D	7,9,11
4	RA4	28°50'13.09"S 31° 4'44.29"E	BPS4	E	8,10
5	RA5	28°49'27.22"S 31° 5'12.31"E	BPS5	F	12,13
6	RA6	28°48'54.92"S 31° 5'13.19"E	BPS6	G	16
7	RA7	28°48'1.67"S 31° 4'35.95"E	BPS7	H	17,18
8	RA8	28°51'9.23"S 31° 0'23.81"E	BPS8	I	29
9	RA9	28°49'10.84"S 30°58'53.24"E	BPS9	J	31
10	RA10	28°50'33.16"S 31° 3'53.40"E	N/A*	N/A*	6

*Plot 6 is small and the configuration of pumps stations and reservoirs necessitates that plot 6 does not require a booster pump station or a reservoir, only a river abstraction pump station.

Pipelines

The pipelines from the abstraction points to the irrigation systems are proposed to comprise HDPE, uPVC and steel materials. The choice is dependent on the diameter of the pipeline required. Sections of pipe exposed above the ground or with an operating pressure in excess of 160 m will also require steel.

Pipe trench dimensions are specified in accordance with SABS 1200 LB, for flexible pipes. Cover above the pipeline is proposed to be a minimum of 900 mm and extend to 1300 mm in-field and at local road crossings to

BASIC ASSESSMENT REPORT

reduce risk of damage from land preparation and vehicles. Where the minimum cover cannot be attained then the pipe will be encased in concrete. Valves will be sized according to the pipe sizes and water flow rates. Air, scour and isolating valves will be installed where necessary. The pipeline will be encased in concrete on stream and road crossings as well as where dongas are encountered.

Fencing

For security, safety and boundary demarcation, fencing will be provided around the irrigation infrastructure: The pump stations will have 1.8 m weld mesh fences with razor wire above; whilst the plots are proposed to have 1.2 m veldspan fences with barb wire above.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN R.544, 545 and 546	Description of project activity
<i>GNR 544, Part 11: The construction of:... ii) channels; ...v) weirs;... xi) infrastructure or structures covering 50 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...</i>	The pump station infrastructure will collectively exceed 50 m ² in size within 32 m of a watercourse.
<i>GNR 544, Part 18: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand ... from i) a watercourse...</i>	The pump station infrastructure will require more than 5 m ³ of soil to be moved within a water course.
<i>GNR 546 Part: 1: The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres. iii. Outside urban areas, in: (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</i>	The construction of water reservoirs for water supply will collectively exceed 250 cubic metres outside an urban area within 5 km of the Tugela and the Nsuzi Rivers which have been identified as National Freshwater Ecosystem Priority Areas (NFEPA)
<i>GNR 546 Part: 14: The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: (1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;</i>	This project complies with the exemption (1) as it is a National Agricultural Project, and is thus not applicable
<i>GNR 546 Part 16: The physical alteration of virgin soil to agriculture, or afforestation for the purposes of commercial tree, timber or wood production of 100 hectares or more.</i>	The project involves the irrigation of approximately 245 ha of land. Some of this land has been cultivated within the last 10 years, however other areas comprise natural veld. The areas proposed to be irrigated are split into community areas, each of which is less than 100 ha. Thus the project does not require a full Scoping

2. FEASIBLE AND REASONABLE ALTERNATIVES

“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Description			
<p>As part of the National CRDP to reach the poorest rural communities, the DRDLR has undertaken an in-house process for area prioritisation to address rural social and economic upliftment. Nkandla, located in northern KwaZulu-Natal has been identified as one of the poorest regions of the Province. To facilitate the Department's goal to achieve sustainable, equitable and vibrant rural communities in Nkandla, support and further development of subsistence-agriculture has been found to incorporate the need to harness water resources in the area. The perennial Tugela and Nsuze Rivers, along which the communities practising agriculture are naturally concentrated, present the best opportunity to extract water to irrigate cultivated lands. Irrigated crops would thus be best positioned along these river watercourses.</p> <p>The Provincial Department of Agriculture has investigated 1083ha of land along these Rivers to identify lands that are suitable to irrigate vegetables for small growers. From the 1083 ha, their study found approximately 531.8 ha showed potential for cultivation.</p> <p>From this short-listed area, further investigations have been conducted to eliminate areas that are considered unsuitable for cultivation for logistical reasons. Specialist studies to assess the impacts on riparian and wetland habitats, biodiversity and heritage have also assisted in identifying the most suitable land available. Factors that influenced the decision for exclusion included:</p> <ul style="list-style-type: none"> • Logistical requirements- vehicle and infrastructural access • Slope of land • Soil suitability • Soil depth • Rockiness • Environmental constraints (e.g. sensitive flora and fauna) <p>A robust process has thus been undertaken to identify the most suitable land for cultivation. Initially 1082 ha was identified for investigation at the beginning of the optioneering process and subsequently 32 plots were short-listed, totalling 531.8 ha. Thereafter, 16 Plots have been excluded for reasons varying from logistical to environmental. The remaining Plots have been divided into sensitive and non-sensitive areas, in accordance with environmental constraints identified through the Specialist studies. The 16 non-sensitive plots identified for this Basic Assessment, which total 245 ha, are listed below in Table 3.</p>			
Table 3: List of non-sensitive plots			
No.	Site ID.	GPS	River
1	1	28°52'5.27"S 31° 2'50.78"E	Confluence of Tugela and Nsuze
2	5	28°50'49.29"S 31° 3'20.28"E	Nsuze
3	6	28°50'33.72"S 31° 3'33.43"E	Nsuze
4	7	28°50'19.63"S 31° 4'8.15"E	Nsuze
5	8	28°50'13.93"S 31° 4'23.80"E	Nsuze
6	9	28°50'9.64"S 31° 4'37.01"E	Nsuze
7	10	28°49'56.37"S 31° 4'47.47"E	Nsuze
8	11	28°49'39.79"S 31° 4'59.78"E	Nsuze
9	12	28°49'19.66"S 31° 4'55.59"E	Nsuze
10	13	28°49'3.93"S 31° 4'25.97"E	Nsuze
11	16	28°48'36.06"S 31° 5'22.73"E	Nsuze
12	17	28°48'19.23"S 31° 5'2.94"E	Nsuze
13	18	28°48'10.93"S 31° 4'34.15"E	Nsuze
14	28	28°53'33.64"S 31° 1'54.00"E	Tugela
15	29	28°51'2.54"S 31° 0'10.93"E	Tugela
16	31	28°49'16.66"S 30°58'53.64"E	Tugela

BASIC ASSESSMENT REPORT

Thus, no alternative sites have been presented further in the Report.

In the case of linear activities:

Alternative:

Alternative S1 (preferred)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Latitude (S):

Longitude (E):

N/A	

Alternative S2 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

N/A	

Alternative S3 (if any)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

N/A	

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

b) Lay-out alternatives for water abstraction and conveyance to cultivated plots

Alternative 1
<p><u>Alternative option 1: Direct delivery in-field</u> For this option, abstraction of water from the Rivers to the cultivated fields would occur directly from the river to the plots and operate on demand. Local Farmers would abstract water from the river and irrigate the fields whenever they wanted to, and, as night time irrigation is unlikely, the abstraction would probably occur during the day when peak electricity rates apply. During the irrigation cycle, water would be abstracted from the Rivers and be delivered directly onto the fields. This would also require the installation of variable speed drive pump sets. This option has not been proceeded with due to the high costs for electricity that would be incurred. Furthermore the high silt content of the Rivers has necessitated the proposal for separate pump sets for abstraction and conveyance.</p>
Alternative 2
<p><u>Alternative option 2: Off channel storage with in-field supply by gravity</u> This option entails five abstraction points from the Rivers. Water is drawn from the Rivers at night time and stored in two earth dams and three concrete reservoirs which provide 24 hour storage. Although off peak electricity rates apply for this option, the costs to construct and maintain the off-channel storage facilities are considered too high. In addition, as the irrigation strategy is a complicated system, it would require one co-operative entity to manage it on behalf of the Farmers. This is considered to add too much complexity and, thus this option has not been proceeded with.</p>

BASIC ASSESSMENT REPORT

Alternative 3: Preferred option

Alternative option 3: Off channel storage with in-field supply by booster pump station

This option entails 10 abstraction points from the Rivers. Water is drawn from the Rivers at night time in a two step process from the river abstraction pump station to the booster pump station and then stored in 11 steel reservoirs which provide 24 hour storage. The high silt content of the rivers has necessitated the proposal for separate pump sets for abstraction and conveyance which this option provides for. In addition, the advantage of off peak electricity rates applies. This is thus the preferred option.

c) Technology alternatives for irrigation systems

Categories of commercially available irrigation systems are flood, static and mobile systems. The systems considered feasible for this project are sprinkler and centre pivots systems. Sprinkler systems are the preferred option. Sprinkler systems can be either dragline or semi-permanent systems. Dragline sprinkler systems have been recommended for this project.

Alternative 1

Centre Pivots

The use of centre-pivots would irrigate the fields from the centre of the plot. However, there is limited flexibility when the plots are not laid out uniformly to maximise on the footprint of the irrigated area. In the case of the identified plots, shapes and sizes are influenced by environmental constraints, soil depth, plot slope and occurrence of rockiness and homesteads. The fields therefore require flexibility from the irrigation system. Centre pivots would not fit into the majority of the plots. Furthermore, the centre-pivots comprise electrical cabling which has a high risk of being stolen because of the scrap metal value. Repair costs for centre-pivot equipment are high and require professional input from the supplier/ qualified technicians. This option is thus the least recommended and will not be proceeded with.

Alternative 2

Semi-permanent sprinkler irrigation system

The semi-permanent sprinkler system is an adaptation of the dragline system with all the pipework buried, thus there is no dragline hose above ground. Only the sprinklernozzle, sprinkler stand and a short connecting hose is required to be moved between stand positions.

Advantages/Disadvantages:

- The sprinkler system has the flexibility to allow different portions of each plot to be irrigated at different times according to the requirements of the irrigator.
- The sprinkler system has portable components. These may be removed from the field and stored when not in use, thus reducing the risk of theft. The plastic hydromatics would be the only component left in the field above ground.
- The sprinkler system may have more frequent operational maintenance requirements than the centre-pivot, but the requirements are easily maintained by unqualified people, at a lower cost.
- The semi-permanent sprinkler system allows for reduced risk of crop damage by dragline hoses.
- The semi-permanent system is less labour intensive than the dragline sprinkler system.
- Capital investment costs are higher than dragline sprinkler systems.
- Hydromatics required for semi-permanent sprinkler operations present obstacles to land preparation machinery when compared to dragline sprinkler system requirements.

Alternative 3: Preferred option

Draglinehose sprinkler irrigation system

The system comprises a bulk supply main with buried laterals. Connected to the laterals, by 25m -36m lengths of dragline hoseare sprinkler nozzles mounted on stands. The sprinklers are able to be relocated along multiple separate stand positions across the length of the dragline hose.

Advantages/Disadvantages:

- Thesprinkler systems have the flexibility to allow different portions of each plot to be irrigated at different times according to the requirements of the irrigator.
- The sprinkler system has portable components. These may be removed from the field andstored

BASIC ASSESSMENT REPORT

when not in use, thus reducing the risk of theft. The plastic hydromatics would be the only component left in the field above ground.

- The sprinkler system may have more frequent operational maintenance requirements than the centre-pivot, but the requirements are easily maintained by unqualified people, at a lower cost, and
- Although labour intensive, the sprinklers are able to be relocated along multiple separate stand positions across the length of the dragline hose, saving on infrastructural costs.

This Option is thus preferred as it offers the most flexibility.

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)
N/A
Alternative 2
N/A
Alternative 3
N/A

e) No-go alternative

If the Nsuzze Irrigation Scheme is not implemented, then the following benefits would not accrue:

- The aim of the CRDP to provide support that leads to sustainable, equitable and vibrant rural communities through infrastructural assistance would not be realised through assistance to the communities of Nkandla, one of the poorest rural wards in South Africa.
- Resulting social and economic upliftment through the CRDP would not occur.
- Resulting food gardens would not be established by the CRDP.
- Skills for correct soil management within the area will not be taught and transferred within the community through the CRDP.
- Soil erosion is likely to persist without the CRDP intervention.
- The high siltation rates currently found within the Rivers due to soil erosion may persist without CRDP intervention.
- There is a lost opportunity for the environment surrounding the NFEPA identified systems of the Tugela and the Nsuzze to have a managed approach with interventions from environmental professionals.

If the Nsuzze Irrigation Scheme is not implemented, then the following disbenefits would not accrue:

- Without the proposed cultivation, there is less risk of pollutants from agriculture (fertilisers and pesticides) from entering the watercourses.
- Without the proposed cultivation, there is less risk of foreign materials being introduced.
- Without the proposed cultivation, there is less risk of soil disturbance and soil compaction.
- Without the proposed cultivation, there is less risk of increased surface run-off from vegetation loss.
- Without the proposed cultivation, there is less risk of increased erosion from unprotected soils, although the irrigation of the soil itself will not increase risk of erosion if managed correctly.

The entire project area is bordered by communal tribal areas. The rural communities that live in the near vicinity practise subsistence agriculture and thus the project area is already highly disturbed. No species of conservation significance have been observed for the sites proposed for cultivation in this Basic Assessment. Agriculture will continue to be the preferred activity in the area, as the Rivers naturally attract the communities with their water supply. The lack of a more sophisticated method of harnessing the River water for irrigation purposes which result in a less successful agricultural yield and contribute to the poverty currently being experienced in the area. There is an acute lack of job opportunities available nationwide and in particular within the rural areas of the country. Creating successful food gardens in the poor rural communities is the first step in alleviating poverty and combating ill-health through a lack of access to food. Furthermore, the proposed project, to socially and economically uplift the community, incorporates the direct participation of the community

BASIC ASSESSMENT REPORT

itself and is thus considered in theory to be a more sustainable investment approach.

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:

Alternative A¹ (preferred activity alternative) All infrastructure

Size of the activity:

2 453761m²

Tables 4-7 below provide details on the various elements of the irrigation infrastructure and plots

Table 4: Sites identified for river abstraction pump stations (RA)

	RA	GPS	Plots serviced	Activity size (m ²)
1	RA1	28°52'52.03"S 31° 2'18.76"E	1,28	6.3
2	RA2	28°50'35.40"S 31° 3'25.26"E	5	6.3
3	RA3	28°49'24.13"S 31° 4'25.68"E	7,9,11	6.3
4	RA4	28°50'13.09"S 31° 4'44.29"E	8,10	6.3
5	RA5	28°49'27.22"S 31° 5'12.31"E	12,13	6.3
6	RA6	28°48'54.92"S 31° 5'13.19"E	16	6.3
7	RA7	28°48'1.67"S 31° 4'35.95"E	17,18	6.3
8	RA8	28°51'9.23"S 31° 0'23.81"E	29	6.3
9	RA9	28°49'10.84"S 30°58'53.24"E	31	6.3
10	RA10	28°50'33.16"S 31° 3'53.40"E	6	6.3

Table 5: Sites identified for booster - pump stations (BPSD)

	BPS	RA	GPS	Plots serviced	Activity size (m ²)
1	BPS1	RA1	28°52'52.84"S 31° 2'25.12"E	1,28	17.2
2	BPS2	RA2	28°50'41.86"S 31° 3'23.77"E	5	17.2
3	BPS3	RA3	28°49'30.78"S 31° 4'26.35"E	7,9,11	17.2
4	BPS4	RA4	28°50'17.39"S 31° 4'37.23"E	8,10	17.2
5	BPS5	RA5	28°49'24.49"S 31° 5'13.75"E	12,13	17.2
6	BPS6	RA6	28°48'52.35"S 31° 5'19.23"E	16	17.2
7	BPS7	RA7	28°48'6.42"S 31° 4'29.31"E	17,18	17.2
8	BPS8	RA8	28°51'7.20"S 31° 0'24.23"E	29	17.2
9	BPS9	RA9	28°49'15.24"S 30°58'59.17"E	31	17.2

¹ "Alternative A.." refer to activity, process, technology or other alternatives.

BASIC ASSESSMENT REPORT

Table 6: Sites identified for reservoirs

	RES	BPS	RA	GPS	Plots serviced	Activity size (m ³)
1	A	BPS1	RA1	28°52'49.32"S 31° 2'57.70"E	1	678
2	B	BPS1	RA1	28°53'9.59"S 31° 2'39.72"E	28	784
3	C	BPS2	RA2	28°50'17.62"S 31° 2'47.73"E	5	928
4	D	BPS3	RA3	28°49'45.67"S 31° 4'29.64"E	7,9,11	1040
5	E	BPS4	RA4	28°50'23.13"S 31° 4'47.36"E	8,10	1121
6	F	BPS5	RA5	28°49'0.76"S 31° 5'24.80"E	12,13	1397
7	G	BPS6	RA6	28°48'50.52"S 31° 5'31.26"E	16	1397
8	H	BPS7	RA7	28°48'12.07"S 31° 4'16.57"E	17,18	1612
9	I	BPS8	RA8	28°50'54.94"S 31° 0'50.30"E	29	1842
10	J	BPS9	RA9	28°52'49.32"S 31° 2'57.70"E	31	2066

Table 7: Sites identified for cultivation plots

	Site ID.	GPS	Activity size (ha)	Activity size (m ²)
1	1	28°52'5.27"S 31° 2'50.78"E	19.35	193 500
2	5	28°50'49.29"S 31° 3'20.28"E	14.94	149 400
3	6	28°50'33.72"S 31° 3'33.43"E	4.07	40 700
4	7	28°50'19.63"S 31° 4'8.15"E	13.41	134 100
5	8	28°50'13.93"S 31° 4'23.80"E	13.27	132 700
6	9	28°50'9.64"S 31° 4'37.01"E	1.7	17 000
7	10	28°49'56.37"S 31° 4'47.47"	4.59	45 900
8	11	28°49'39.79"S 31° 4'59.78"E	19.74	1 97 400
9	12	28°49'19.66"S 31° 4'55.59"E	8.45	84 500
10	13	28°49'3.93"S 31° 4'25.97"E	7.6	76 000
11	16	28°48'36.06"S 31° 5'22.73"E	14.38	143 800
12	17	28°48'19.23"S 31° 5'2.94"E	22.75	227 500
13	18	28°48'10.93"S 31° 4'34.15"E	32.65	326 500
14	28	28°53'33.64"S 31° 1'54.00"E	12.39	123 900
15	29	28°51'2.54"S 31° 0'10.93"E	34.9	349 000
16	31	28°49'16.66"S 30°58'53.64"E	21.1	211 000
		Total	245.29	2 452 900

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative A1 (preferred activity alternative)

Size of the site/servitude:

N/A m²

4. SITE ACCESS

Does ready access to the site exist?

YES

If NO, what is the distance over which a new access road will be built

m

Describe the type of access road planned:

Access to the project areas off the R74 Road towards Kranskop. Proceed to Ntunjambili and then turn towards the Thukela River Valley along the D1640 Road and travel for approximately 10 km towards a bridge that crosses the river. The proposed areas for the irrigation development are situated all along the Tugela and Nsuze Rivers (northern and eastern bank).

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;

BASIC ASSESSMENT REPORT

- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

This section makes use of the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Guideline on Need and Desirability (August 2010) (DEA&DP 2010):		
1. Is the activity permitted in terms of the property's existing land use rights?	YES <input type="checkbox"/>	Please explain
The property is un-zoned and currently used for agriculture. The land is held under trust for Traditional Authority by the Ingonyama Trust.		
2. Will the activity be in line with the following?		
(a) Provincial Spatial Development Framework (PSDF)	YES <input type="checkbox"/>	Please explain
Provincial Spatial Development Framework (PSDF) accessed at http://www.kznppc.gov.za/Portals/0/Documents/PGDS%20Annexure%20C%20-%20Provincial%20Spatial%20Development%20Framework%20(Draft%202).pdf South Africa and KwaZulu-Natal face three main challenges - reducing poverty and inequality, and tackling unemployment. The main challenge for KwaZulu-Natal is that of poverty and underdevelopment. Four key sectors have been identified in the KwaZulu-Natal PSDF as drivers of economic growth in the Province. One of the sectors is the Agricultural sector. This sector has massive potential for growth and is the largest existing or potential employer in rural areas. The sector can make the greatest impact on reducing poverty levels in rural areas, but urgently needs transformation. See 2f below for detailed information on the Department of Rural Development and Land Reform (DRDLR) investment programme in support of this goal.		
(b) Urban edge / Edge of Built environment for the area	<input type="checkbox"/> NO	Please explain
KwaZulu-Natal Department of Local Government and Traditional Affairs, Urban Development Framework Manual July 2011, Chapter 1 and 4 Suburbs and Infill Areas. accessed at http://devplan.kzntl.gov.za/DOCUMENTS_UPLOAD/urban_development_framework.aspx The concept of urban edge does not apply to this project as it is located in a rural area.		

BASIC ASSESSMENT REPORT

<p>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</p>	<p>YES</p>	<p>Please explain</p>
---	------------	-----------------------

Nkandla IDP accessed at :<http://www.nkandla.org.za/default.aspx?pg=ec2fc200-4a74-42f0-8b7a-f19a55fc6183>

One of the strategic objectives of the Nkandla Local Municipal IDP is to promote local business and self-sustenance. The IDP pledges support interventions by other development agencies aimed at capacitating the community at large. Aligning to National and Provincial priorities, the IDP states that the Municipality aims to reduce poverty, unemployment and the prevalence of disease through skills development. This includes the capacitating of local entrepreneurs to enable them to compete nationally.

Nkandla SDF accessed at:

http://devplan.kzntl.gov.za/idp_reviewed_2009_10/IDPS/KZ286/Adopted/Nkandla%20SDF%20IDP%20extract.PDF

Land in the Nkandla Municipality area has been identified as having high agricultural potential. This applies generally to the land in the Nsuzu Irrigation scheme area, although localised areas identified as having low agricultural potential have been excluded. The SDF promotes the effective and efficient use of this land and discourages urban development. According to the SDF, initiatives to be supported are thus large scale communal based farming. The SDF reasons that agricultural development of these areas could lead to job creation and economic development but that an increase in the quality of people's lives to combat poverty, hunger and disease is the main priority. Refer to Figure 1 for an indication of sensitive areas in Nkandla in relation to the proposed site area.

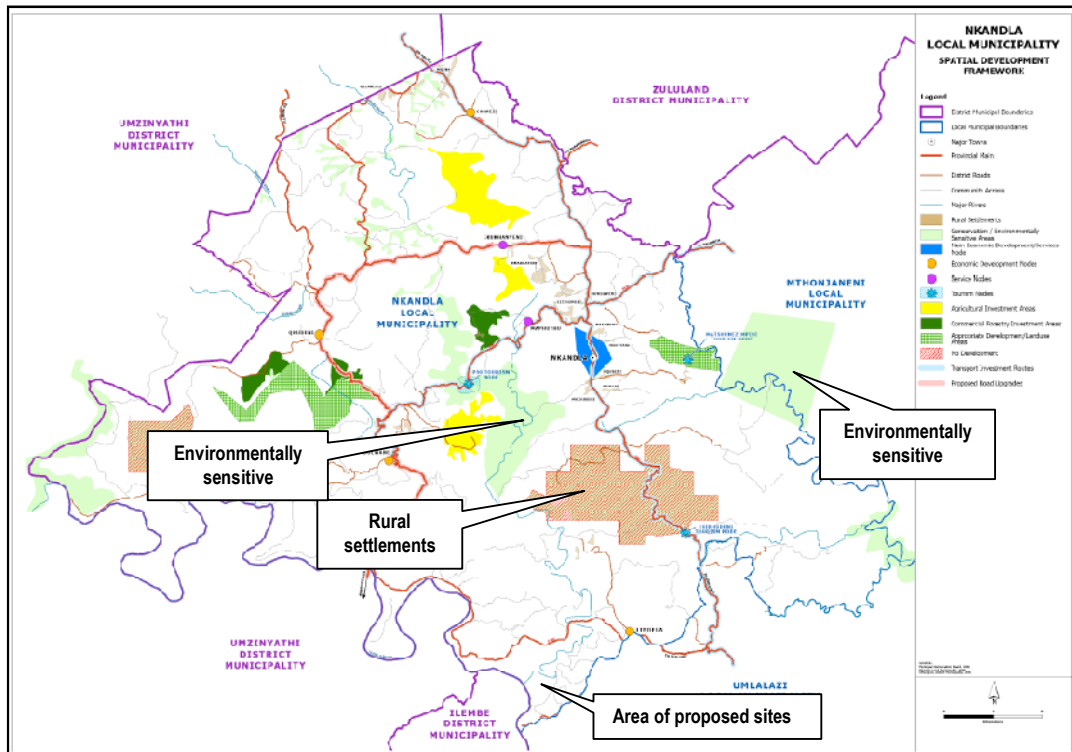


Figure 1: Nkandla SDF demonstrating no environmental constraints for proposed site area

<p>(d) Approved Structure Plan of the Municipality</p> <p>As above</p>	<p>YES</p>	<p>Please explain</p>
--	------------	-----------------------

BASIC ASSESSMENT REPORT

<p>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</p>		NO	Please explain
See 2c above.			
<p>(f) Any other Plans (e.g. Guide Plan)</p>	YES		Please explain
<p>The Department of Rural Development and Land Reform (DRDLR) currently has five Development Programmes, one of which is the Comprehensive Rural Development Programme (CRDP). The purpose of the Programme is to provide support that leads to sustainable, equitable and vibrant rural communities. This CRDP incorporates two of the DRDLR strategic objectives, namely:</p> <ul style="list-style-type: none"> • To reach all the poorest rural wards in all rural municipalities; and • To establish food gardens. <p>The programme incorporates 23 South-African District Municipalities which represent the poorest rural wards in all rural Municipalities. The Uthungulu District Municipality is amongst the nine Districts selected from within the KwaZulu Natal Province. The Nsuzo Irrigation Scheme is located within the Nkandla Local Municipality of Uthungulu.</p>			
<p>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</p>	YES		Please explain
See 2c and f above. The investment programme is being funded by National Government and is behind schedule.			
<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	YES		Please explain
<p>The Department of Rural Development and Land Reform (DRDLR) has identified the area of Uthungulu District to benefit from the Comprehensive Rural Development Programme (CRDP). The purpose of the Programme is to reach all the poorest rural wards in all rural municipalities; and to establish food gardens to address poverty and hunger. Uthungulu District Municipality contributes to 8% of KZN goods and services. Nkandla is a poor region within the Uthungulu District with household income source at 50% for government grants and 16% for subsistence farming. There is little circulation of money within Nkandla. There is a very low level of literacy (50% of people have no education) and unemployment is high, at 90%. The town of Nkandla is the only formal urban area in Nkandla. The area is not linked to any development corridor and there are limited access roads into the area. The majority of land (80%) is Traditional Authority, held in trust by the Ingonyama Trust. Poverty and hunger are major issues for this rural area. The irrigation scheme thus has a high societal priority which has been identified at a local level and elevated to National importance.</p>			
<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	YES		Please explain
Three phase overhead power lines exist to supply electricity to the pump stations.			

BASIC ASSESSMENT REPORT

<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	NO	Please explain
<p>There will be no impact on infrastructural planning.</p>		
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	YES	Please explain
<p>Refer to points 2c and 2f.</p>		
<p>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</p>	YES	Please explain
<p>The irrigation scheme has been located alongside the rivers which will provide the water to irrigate the agricultural sites.</p>		
<p>9. Is the development the best practicable environmental option for this land/site?</p>	YES	Please explain
<p>Agriculture is the existing land use at these sites. The irrigation scheme is intended to promote the land-use further. Urban development of this area is not a consideration due to the high agricultural potential of the land. The area is not linked to a development corridor.</p>		
<p>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</p>	YES	Please explain
<p>The plots exclude all areas of environmental sensitivity. Potential impacts to the freshwater ecosystems through the cultivation of these plots could include: the risk of foreign materials being introduced; the risk of pollutants, (e.g. agricultural pesticides and fertilisers) being introduced; the risk of soil disturbance and soil compaction; the risk of increased surface run-off from vegetation loss; and the risk of increased erosion from unprotected soils. Provided that the recommendations which have been made by the Specialists to maintain the ecological integrity of the area (adherence to buffer zones, the control of run-off within the plots and the rehabilitation and management of the riparian habitat) are adhered to, then the positive impacts of the provision of food, addressing poverty and hunger will far outweigh the potential negative impacts.</p>		
<p>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</p>	NO	Please explain
<p>The answer is actually neither yes nor no. If the scheme succeeds in alleviating poverty and hunger for those that it is intended to relieve, then the proposed development may indeed set a precedent within country. However, other poor areas in the country which have already been identified within the same investment programme, are in various stages of development for the same proposal.</p>		
<p>12. Will any person's rights be negatively affected by the proposed activity/ies?</p>	NO	Please explain
<p>Conversely, the irrigation scheme will promote the aims of the Bill of Human Rights by assisting with the alleviation of poverty and hunger.</p>		
<p>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</p>	NO	Please explain
<p>N/A</p>		
<p>14. Will the proposed activity/ies contribute to any of the 18 Strategic Integrated Projects (SIPs)?</p>	YES	Please explain
<p>SIPs accessed at http://www.info.gov.za/issues/national-infrastructure-plan/#water The SIPs cover social and economic infrastructure – across all 9 provinces (with an emphasis on lagging regions). Strategic Integrated Projects cover catalytic projects that can fast track development and growth. Work is being</p>		

BASIC ASSESSMENT REPORT

aligned with key cross-cutting areas: human settlement planning and skills development.	
SIP 11: Agri-logistics and rural infrastructure: Improve investment in agricultural and rural infrastructure that supports expansion of production and employment, small-scale farming and rural development, including:	
<ul style="list-style-type: none"> • facilities for storage (silos, fresh-produce facilities, packing houses). • transport links to main networks (rural roads, branch train-line, ports). • fencing of farms. • irrigation schemes to poor areas. • improved R&D on rural issues (including expansion of agricultural colleges). • processing facilities (abattoirs, dairy infrastructure). • aquaculture incubation schemes. • rural tourism infrastructure. 	
15. What will the benefits be to society in general and to the local communities?	Please explain
<ul style="list-style-type: none"> • Alleviation of hunger is primary benefit. • Alleviation of poverty, disease and unemployment. • Installation of irrigation infrastructure provides valuable infrastructure and increased technology in the area. • There are employment opportunities for local communities, both temporary and permanent, from the construction and operational phases. • Training and development will be provided by the DRDLR. • Economic stimulation resulting from increased wealth within area and circulation of money. • Sustainable development. 	
16. Any other need and desirability considerations related to the proposed activity?	Please explain
N/A	
17. How does the project fit into the National Development Plan for 2030?	Please explain
<p>The National Development Plan for 2030 access at: http://www.info.gov.za/view/DynamicAction?pageid=623&myID=348761</p> <p>A rural development strategy that focuses on raising agricultural output, providing basic services, supporting small farmers, broadening land ownership and investing in water, transport and other network infrastructure. A well implemented strategy to boost agricultural output could create up to 1 million jobs by 2030 (NDP for 2030: 117, Spatial dynamics and rural improvement).</p>	
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
As part of the feasibility work undertaken for this proposal, Specialists have been consulted during the design and development of appropriate alternatives. The environment has been investigated by Vegetation Fauna Specialists and Freshwater Ecologists. Mitigation measures have been developed to address the potential environmental impacts identified by the Specialists. Participation of all Interested and Affected Parties has been facilitated (refer to Appendix E).	
19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.	
Section 2 of NEMA states that 'Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.	

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

BASIC ASSESSMENT REPORT

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Conservation of Agricultural Resources Act (43)	The control of alien vegetation.	Department of Agriculture, Forestry & Fisheries	1983
National Heritage Resources Act (25)	The potential for development to impact on heritage resources.	National Heritage Resources Agency	1999
World Heritage Conventions Act (49)	As above	Department of Environmental Affairs	1999
The National Environmental Management: Biodiversity Act (10)	The protection of natural resources.	Department of Environmental Affairs	2004
National Environmental Management: Protected Areas Act (57)	The protection of natural resources.	Department of Environmental Affairs	2003
The Mountain Catchments Areas Act (63)	The wetland system assists with the purification of water.	Department of Water Affairs	1970
MTPA Biodiversity Conservation Plan	The protection of natural resources.	Department of Economic Development & Environmental Affairs / Mpumalanga Tourism and Parks Agency	
IEM Guideline 5: Companion Guideline on the Implementation of the Environmental Impact Assessments Regulations	Assistance with the conducting of the Environmental Authorisation process.	Department of Environmental Affairs	2010
IEM Guideline 6: Environmental Management Framework Guideline	Assistance with the conducting of the Environmental Authorisation process.	Department of Environmental Affairs	
IEM Guideline 7: Public Participation Guideline	Assistance with the conducting of the Environmental Authorisation process.	Department of Environmental Affairs	

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES

If YES, what estimated quantity will be produced per month?

Impossible to predict

How will the construction solid waste be disposed of (describe)?

The proposed activities are the establishment of pump stations, laying of pipelines, installation of irrigation systems and instalment of fencing around infrastructure. These construction activities will not generate large volumes of solid waste. There may be limited quantities of recyclable wastes (such as empty cement bags and domestic waste from the labour force). This type of waste will be collected on site and disposed of at the nearest recycling depot. If it emerges that any part of this waste cannot be recycled, it must be disposed of at the nearest permitted landfill site.

Where will the construction solid waste be disposed of (describe)?

Waste will be collected on site and disposed of at the nearest recycling depot. If it emerges that any part of this waste cannot be recycled, it must be disposed of at the nearest permitted landfill site.

Will the activity produce solid waste during its operational phase?

NO

If YES, what estimated quantity will be produced per month?

N/A m3

How will the solid waste be disposed of (describe)?

BASIC ASSESSMENT REPORT

N/A

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

N/A

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

N/A

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? YES NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? YES NO

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? YES NO

If YES, what estimated quantity will be produced per month? Impossible to predict

Will the activity produce any effluent that will be treated and/or disposed of on site? YES NO

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? YES NO

The activity will not produce effluent, other than normal sewage by staff, during the construction phase that will be disposed of in chemical toilet ablution facilities. These chemical toilets must be located more than 100 m from rivers, wetlands and drainage lines, and must be properly maintained. The chemical toilet supplier must empty these toilets, as and when needed.

If YES, provide the particulars of the facility:

Facility name:	N/A	
Contact person:		
Postal address:		
Postal code:		
Telephone:	Cell:	
E-mail:	Fax:	

BASIC ASSESSMENT REPORT

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities? NO

If YES, is it controlled by any legislation of any sphere of government? NO

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

The activity will not release emissions into the atmosphere other than limited exhaust emissions and dust associated with construction phase activities.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA? NO

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise? NO

If YES, is it controlled by any legislation of any sphere of government? NO

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the noise in terms of type and level:

Noise will only be generated during the construction phase. Noise generation will be limited to the workers interactions and activities, concrete mixers or pumps, if utilised.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	River, stream, dam or lake	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------	----------------------------	--------------------------	--------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs? YES

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

Pump Station	Peak daily (m³)	Peal monthly (m³)
---------------------	------------------------	--------------------------

BASIC ASSESSMENT REPORT

RA 1	4701	145724
RA 2	903	27995
RA 3	2751	85284
RA 4	1471	45608
RA 5	1196	37080
RA 6	1376	42642
RA 7	3911	121252
RA 8	2488	77126
RA 9	1956	60626
RA 10	317	9826

A Water Resources Assessment (contained in Appendix D4) was undertaken for this project for Quaternary Catchments V40D (Nsuzi River) and V40E (Tugela River).

Sufficient access to water is considered adequate if there is a 75% assurance of supply (i.e. based on lowest flow during a particular year. Full demand may not be met once every four years). The assessment found that there is sufficient yield available to meet the potential irrigation project demand and to maintain the ecological flows within the Rivers. Available irrigation depths for the plots are:

- 5.46 mm (equating to 252.78 ha) for plots of land lying adjacent to the Nsuzi River; and
- 138+ mm for plots of land adjacent to the Tugela River.

14. ENERGY EFFICIENCY

Describe the design measures, if any that have been taken to ensure that the activity is energy efficient:

Eskom electricity will be used for the river abstraction and booster pump stations. Except for RA10, the pumps will be used at night time to fill the reservoirs. This is off-peak electricity usage which will significantly increase energy efficiency.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

N/A

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section Band indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative
The section below applies to all proposed irrigation structure and cultivated plots.

3. Has a specialist been consulted to assist with the completion of this section? YES NO
 If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Kwazulu-Natal
District Municipality	Uthungulu
Local Municipality	Nkandla
Ward Number(s)	13,14
Farm name and number	Reserve No. 19, Farm No. 15389
Portion number	
SG Code	NOGU00000001583900000

0	G	U	0	0
---	---	---	---	---

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

Un-zoned. Used for agriculture.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? NO YES

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

The topography within the study area includes low lying plains alongside the river banks bounded by undulating slopes which extend up to 250 m above the river. Ground level elevation ranges from 200 – 320 meters above sea level.

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	<input checked="" type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input checked="" type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	2.6 Plain	<input type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>

The area features low lying plains along the banks of the rivers and undulating slopes which extend up to 250 m above the river.

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:
Shallow water table (less than 1.5m deep)	NO
Dolomite, sinkhole or doline areas	NO
Seasonally wet soils (often close to water bodies)	NO
Unstable rocky slopes or steep slopes with loose soil	NO
Dispersive soils (soils that dissolve in water)	NO
Soils with high clay content (clay fraction more than 40%)	NO
Any other unstable soil or geological feature	NO
An area sensitive to erosion	YES

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

BASIC ASSESSMENT REPORT

The greater region is underlain by sediments of the Karoo Supergroup. Adelaide and Tarkastad Subgroups dominant the area followed by Ecca Group shale.

An Agricultural Potential Assessment (contained in Appendix D5) was undertaken for this project. Although soil permeability was found to be slightly restricted for the majority of the plots, all other soil characteristics were found to be suitable for crop cultivation. The Assessment concluded that, with the correct management (particularly with regards to the soil water content), there were no significant constraints that would limit the agricultural potential of the proposed sites for crop cultivation. Where macro/micronutrients are found to be lacking, fertiliser applications are recommended.

The main constraint for some of the plots within the project area for irrigated annual crops was identified as soil depth, rockiness and slope.

The project area has soil which is classified as having a high erosion risk. The high intense rainfall coupled with slope steepness and soil with erosive qualities makes soil erosion a significant concern in the project area. The historical land management practices contribute to this problem. The Rivers exhibit high sediment loads and depositional features as a result of sediment running into the River systems from the steep catchment areas. It will thus be essential to apply robust soil conservation practices. However, the irrigation of the soils will not increase the risk of soil erosion on the project area.

4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

The historical dominant vegetation type present would have been the Eastern Valley Bushveld which has been classified as ‘least threatened’.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River (adjacent, buffer zones respected)	YES		
Non-Perennial River (adjacent, buffer zones respected)	YES		
Permanent Wetland		NO	
Seasonal Wetland (adjacent, buffer zones respected)	YES		
Artificial Wetland		NO	
Estuarine / Lagoonal wetland		NO	

BASIC ASSESSMENT REPORT

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The project area falls within Quaternary Catchments V40D (Nsuzi River) and V40E (Tugela River). The catchments areas contributing to the Rivers are approximately 788 km² and 17 217 km² respectively.

The V40E region has a low mean annual precipitation of 728.5 mm and a high mean annual potential evapotranspiration of 1787.2 mm. The V40D region has a low mean annual precipitation of 798.4 mm and a high mean annual potential evapotranspiration of 1789.5 mm.

The plots are located adjacent to the Tugela and Nsuzi Rivers. The Rivers are free-flowing perennial major rivers and classified as riparian C-channel systems. The tributaries are all classified as non-perennial riparian A-channels. The freshwater ecosystems within the project area are thus predominantly fed by surface water and where wetlands occur, they are fringe wetland habitats adjacent to the river.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

A Heritage Impact Assessment Report has been completed. Heritage sites have been found adjacent to some of the plots. The buffer zones recommended by the Specialist have been respected for the sites in this application. The following sites are relevant:

Table 8: Sites which excluded areas for heritage resources

Plot No.	GPS	ha	Sensitivities in the area that have been avoided
1	28°52'5.27"S 31° 2'50.78"E	19.35	• Recommended heritage buffer of 100m applied
28	28°53'33.64"S 31° 1'54.00"E	12.39	• Recommended heritage buffer of 100m respected
31	28°49'16.66"S 30°58'53.64"E	21.1	• Recommended heritage buffer of 100m respected

BASIC ASSESSMENT REPORT

Thus there will be no impact between the heritage sites and the cultivated plots.

A 50m buffer between the cultivated plots and the Rivers, streams and drainage channels have been applied as recommended, thus there will be no impact on those River streams and wetlands provided that the buffer zone is adhered to, and that management measures to control run-off within plots; riparian habitat rehabilitation and management is applied, as recommended in this Report.

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

N/A

If any of the boxes marked with an "A" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

The activity is proposed for the informal housing population. There will be a positive impact for the informal settlements because they will have access to irrigation for their crops.

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	NO
Core area of a protected area?	NO
Buffer area of a protected area?	NO
Planned expansion area of an existing protected area?	NO
Existing offset area associated with a previous Environmental Authorisation?	NO
Buffer area of the SKA?	NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

The plots proposed for irrigation are situated adjacent to the Tugela and Nsuzi Rivers. The proposed sites are bordered by tribal communal areas comprising traditional and modern variations on Nguni dispersed settlement patterns less than 60 years old. The proposed plots adjacent to the Rivers are on alluvial and colluvial soils, some of which are already in use for cultivation and grazing purposes. The rural homesteads are occupied by small-scale subsistence farming. Land use includes cultivated lands; fallow croplands; abandoned croplands; grazed open woodland for cattle and goats; and dense bush used mostly for wood harvesting.

The Tugela River catchment encompasses the entire project area, of which, the central area is classified as rural. Surrounding the project area is Valley Bushveld. In the river valleys and grasslands, there is Thornveld vegetation which is disturbed on the higher altitudes.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

	NO
--	----

A Heritage Impact Assessment has been undertaken and is contained in Appendix D3. Early stone age sites were identified within the greater project area but for the sites specified in this Basic Assessment, no cultural or historical features are present. There are no buildings or structures older than 60 years in close proximity to the site. There is no known area of cultural significance, and it is therefore not necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999).

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

N/A

Will any building or structure older than 60 years be affected in any way?
 Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?
 If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

	NO
	NO

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

Unemployment is high, at 90%.

Economic profile of local municipality:

Uthungulu District Municipality contributes to 8% of KZN goods and services. Nkandla is a poor region within the Uthungulu District with household income source at 50% for government grants and 16% for subsistence farming. There is little circulation of money within Nkandla.

Level of education:

There is a very low level of literacy (50% of people have no education)

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?
 What is the expected yearly income that will be generated by or as a result of the activity?
 Will the activity contribute to service infrastructure?

	R60 million
	unknown
	NO

BASIC ASSESSMENT REPORT

Is the activity a public amenity?	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	100
What is the expected value of the employment opportunities during the development and construction phase?	R 500,000
What percentage of this will accrue to previously disadvantaged individuals?	95%
How many permanent new employment opportunities will be created during the operational phase of the activity?	60
What is the expected current value of the employment opportunities during the first 10 years?	Impossible to predict
What percentage of this will accrue to previously disadvantaged individuals?	99%

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

- a) **Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category	If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	The project area is not highlighted as a priority in the Biodiversity Conservation Plan.

- b) **Indicate and describe the habitat condition on site**

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	5%	The natural areas are valley bushveld.
Near Natural (includes areas with low to moderate level of alien invasive plants)	10%	There is thornveld vegetation, which is disturbed on the higher altitudes
Degraded (includes areas heavily invaded by alien plants)	40%	Specialist studies have identified the majority of the area as degraded with low diversity. All sensitive areas have been excluded from this application (e.g. riverine woodland,

BASIC ASSESSMENT REPORT

		ecosystem corridors, drainage channels, rivers, streams, wetlands and areas with rich biodiversity)
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	45%	In the river valleys and grasslands, land use includes cultivated lands; fallow croplands; abandoned croplands; grazed open woodland for cattle and goats; and dense bush used mostly for wood harvesting.

c) Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems					
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)		Estuary		Coastline	
	Endangered						
	Vulnerable						
	Least vulnerable		NO		NO		NO

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

Freshwater ecosystem/wetland assessment and delineation (Appendix D2)

The systems have been modified by the surrounding land-use which is predominantly subsistence-agriculture. Surrounding land consists of cultivated lands; fallow croplands; abandoned croplands; grazed open woodland for cattle and goats; and dense bush used mostly for wood harvesting. Flooding events occur frequently in the rainy season resulting in water level fluctuations. Sediment from the steep catchments has led to major depositional features along the river courses and high river sediment loads.

Both the Tugela and the Nsuze have been identified as National Freshwater Ecosystem Priority Areas (NFEPA), but the Nsuze River has been prioritised as a flagship free-flowing river for upstream catchment management with three of the wetlands along the River also classified as NFEPA systems (refer to Figure 2-1 in the Wetland mapping Report contained in Appendix D6). The ecosystems on the Tugela and the Nsuze would require to be functionally maintained to avoid a cumulative downstream effect. Agriculture within the catchment should therefore be controlled. The recommended buffer standard for around streams and wetlands that drain into FEPA Rivers is 100m. The plots included in this Basic Assessment are situated on both the Nsuze (1,5,6,7,8,9,10,11,12,13,16,17,18,28) and Tugela River (29,31). The Wetland Specialist has recommended a buffer zone of 50m. The recommended buffer zone would comprise a filter strip of natural vegetation adjacent to the proposed plots. This must be coupled with management measures to control run-off within plots; riparian habitat rehabilitation and management. These mitigations form the recommendations of this Report.

The Biodiversity Assessment (Appendix D1) found the habitat and species diversity was varied throughout the project area. The sites selected for this Basic assessment were characterised as degraded sites with low diversity. The plots have:

- No threatened species or species of conservational significance;
- No special habitats;
- No significant dongas;
- No watercourses or drainage channels;
- No eroded gullies;
- No gravelly and shallow soils;
- No ecological links to similar habitats;
- No riverine woodland;
- No steep slopes that preclude cultivation; and
- No significant loss of topsoil on old lands that would preclude cultivation.

For the plots identified in this Basic assessment, there are no ecological constraints. Specialists concluded that there would be no significant effects on fauna or flora on the sites proposed for cultivation, and thus the plots are considered suitable for cultivation.

The Biodiversity Specialists have recommended measures to protect ecological processes and local species (refer to the Biodiversity Screening Report in Appendix D7). These mitigations include:

- Cultivation should be set back from the rivers, unlike the areas currently under cultivation. A buffer zone from the high-water mark of rivers should be adhered to. The Rivers provide unique habitats for flora and fauna (A 50m buffer zone has been applied).

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	The Witness	
Date published	22 November 2012	
Site notice position	Latitude	Longitude
	28° 53' 48,35" S	31° 01' 41,98" E
Date placed	29 October 2012	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
M. Maharaj	Department of Water Affairs	thakurdinm@dwa.gov.za
A. Mnyungula	Department of Forestry and Fishing	AyandaMn@nda.agric.za
N.P Myeni	Provincial Dept of Agriculture	nonhlanhla.myeni@kzndae.gov.za
M. Schmid	Department of Transport	NICOLM@eskom.co.za
K. Khali	Department of Rural Development	KKali@ruraldevelopment.gov.za
N. Pillay	Ezemvelo KZN Wildlife	pillaya@kznwildlife.com
M. Nicol	Eskom	NICOLM@eskom.co.za
W. Tshabalala	AMAFA	archaeology@amafapmb.co.za; bernadetp@amafapmb.co.za
M.E. Ngonyama	Nkandla Local Municipality	MNgonyama@nkandla.org.za
B. B. Biyela	uThungulu District Municipality	sceo@uthungulu.co.za
B. Benson	Ingonyama Trust	bensonb@ingonyamatrust.org.za
A Ferendinos	KZN Crane Foundation	andrew@enviroplan.co.za
Chief Magwaza	Chief	On site
Chief Zuma	Chief	On site

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
Impacts on wetland riparian ecosystems and associated fauna.	A Freshwater Ecosystem/Wetland Assessment and delineation has been completed (refer to Appendix D2). The proposed plots have had a 50m buffer exclusion zone for rivers, drainage lines and wetland areas applied. Recommendations made by the Specialists to mitigate against potential negative impacts on the ecological integrity of the hydrological features include adherence to the buffer zones, the control of run-off within the plots and the rehabilitation and management of the riparian habitat. These recommendations have been included in the EMPr (refer to Appendix G).
Vegetation Specialist Report should be compiled to assist in determining the extent that the development may have on the natural vegetation / natural forests or protected trees under the National Forests Act, 1998 (Act No. 84 of 1998).	A Biodiversity Assessment has been conducted for the area (refer to Appendix D1). Buffer zones have been applied between the proposed plots and any ecological constraints identified in the areas (e.g. ecological corridors). The proposed plots are considered degraded and of low biodiversity. Specialists concluded that there would be no significant effects on fauna or flora on the proposed sites. The Specialist has recommended a buffer zone between the rivers and the proposed plots. A buffer zone of 50m has been applied.
Impact on soil erosion.	The landscape is prone to erosion. Changes in the land management can potentially contribute to further erosion. Recommendations provided by the freshwater ecosystem Specialist include rehabilitative measures to riparian habitat and the deactivation of erosion features. These recommendations have been included in the EMPr (refer to Appendix G).
Waste management.	Construction waste will be collected on site and disposed of at the nearest recycling depot, and if not recyclable then at the nearest permitted landfill site. Waste management controls for both construction and operational phases have been detailed in the EMPr (refer to Appendix G).

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

BASIC ASSESSMENT REPORT

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
AMAFA	W.Tshabalala	021 462 4502	021 462 4509	info@sahra.org.za	PO Box 4637, Cape Town, 8000
Provincial Department of Water Affairs	M.Maharaj	031 3362 750	031 305 9915	pillayr@dwa.gov.za	P O Box 1018, Durban, 4000
Ezemvelo KZN	Dominic Wierners	033 845 1425		wienersd@kznwildlife.com	P O Box 13053, Cascades, 3202
Eskom	M. Schmid	031-7105404	086 667 2564	NICOLM@eskom.co.za	P.O. Box 66, New Germany, 3620
Department of Agriculture, Forestry and Fisheries	A. Mnyungula	0333927738		NeziswaMe@nda.agric.za	P/Bag x 9029, Pietermaritzburg, 3200
Department of Transport	M. Scmid	033 355 0570	033 342 3962	michele.schmid@kzntransport.gov.za	Private Bag X9043, PMB 3200
Provincial Department of Agriculture	N.P Myeni	033 343 8136	033 355 9330	nonhlanhla.myeni@kznda.e.gov.za	Private Bag X9059, PMB, 3200
Uthungulu District Municipality	Mr B BBiyela	035 799 2501		sceo@uthungulu.co.za	Private Bag X1025, Richards Bay, 3900
Nkandla Local Municipality	M.E. Ngonyama	035 833 2000/1	035 833 7920	MNgonyama@nkandla.org.za	P O Box 161, Nkandla, 3855

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

BASIC ASSESSMENT REPORT

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

A) Construction Phase: Alternative 1 (preferred alternative)

Activity	Impact summary	Significance		Proposed mitigation
		Without mitigation	With mitigation	
	Direct impacts:			
	<u>Construction of pump stations (river abstraction and booster pumps), Pipeline trenching (from pump stations to reservoirs, from reservoirs to plots)</u> <ul style="list-style-type: none"> • Pump station construction is located within/close to the 50m buffer zone of the rivers, Pipeline trenching will occur within the 50m buffer zone of the rivers, within the riverine habitat and some natural vegetation areas beyond. Potential risks are listed below: <ul style="list-style-type: none"> ➢ Aquatic ecosystem impacts ➢ Flora and Fauna disturbance ➢ Soil profile disturbance and soil erosion ➢ Flora and fauna disturbance 	High (-)	Low (-)	<ul style="list-style-type: none"> • Before commencing with any work, all staff members must be appropriately briefed about the potential environmental impacts from construction, the EMPr and relevant occupational health and safety issues.
	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> • Site clearance for construction can result in direct loss of habitat and species. • Although species of floral conservational significance have not been observed on the proposed sites, some may still be identified during the construction phase. 	High (-)	Low (-)	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> • A plant rescue programme should be conducted on the property prior to the commencement of vegetation clearing. Any plants identified as having conservation significance should be relocated to areas outside of the proposed development footprint.

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	<ul style="list-style-type: none"> There is the potential for alien vegetation to become established where areas are cleared for the establishment of the pump stations, digging of trenches, laying of pipelines and the clearing of cultivation plot boundaries, thereby reducing ecological functionality. 			<ul style="list-style-type: none"> Indigenous vegetation must be stockpiled for reuse for rehabilitation when construction is complete. Damage to the habitats must be kept to a minimum to prevent loss of species, soil erosion and sediment pollution from run-off. Thus, unnecessary clearing of vegetation must be avoided and a phased approach to the clearing should be adopted to limit extended periods of ground exposure. Clearing should also be avoided during sensitive periods of the year. Vegetation clearing on the site should also only take place immediately prior construction to minimise dust, soil erosion and the potential for alien vegetation to become established. An alien vegetation control programme must be implemented on the site. Ensure that disturbed areas are re-vegetated as soon as possible after clearing. The rehabilitation of disturbed areas must adhere to the rehabilitation guidelines provided in the EMP. The buffer zones must be respected at all times. The buffer zones must be accurately pegged before construction occurs.
	<p><u>Aquatic eco-system impacts</u></p> <ul style="list-style-type: none"> Where abstraction pump stations require vegetation removal close to the river, bank destabilisation could occur. There is the potential for construction activities to contaminate the river, aquatic ecosystems and drainage lines at the various locations which intersect with the hydrological features. Pollution from construction-related activities could enter the ecosystem (litter, fuel leaks, shutter oil and lubricating fluid spills, litter, cement and contaminated wash-down water). Potential of contamination of the drainage lines to the rivers, and the impact on downstream water users if a storm water management plan is not in place during construction. Additional sediment could enter the watercourse during construction of the irrigation infrastructure and plots. This could result in the build-up of silt downstream, and thus the increase in water turbidity, which could negatively impact upon the aquatic ecosystem. 	High (-)	Low (-)	<p><u>Aquatic eco-system impacts</u></p> <ul style="list-style-type: none"> Site workers must undergo environmental induction training before undertaking work so that they are aware of the various environmental requirements. The induction training must address the risks of potential contamination to aquatic ecosystems from construction pollution There must be no polluting of watercourses, whether flowing or not and construction vehicles must not drive through the watercourses. The buffer zones must be respected at all times. The cutting of the banks of any watercourses for thoroughfare must be avoided. Crossings for drainage lines and perennial/non-perennial streams must be considered by the Engineer in consultation with an Environmental Specialist, prior to construction. Where fringe wetlands are encountered these may need to be deviated around. Bank destabilisation during construction will require additional stabilisation measures while the bank is rehabilitated, especially

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
				<p>if there is a risk of raised water levels.</p> <ul style="list-style-type: none"> • Soil used in interventions must be stabilised. Support must be provided to river banks/drainage slopes during construction to prevent the movement of soil and sediment deposition into the river. • Where sand bags are used to support natural areas whilst construction is undertaken, earth that is used to fill sand bags should come from and be returned to the designated existing excavation points. • Sandbags, if used must be in a good condition, so that they do not burst. • Most pollution incidents can be avoided through identification of potential sources of pollution and appropriate environmental awareness and staff training. Areas of high risk should be located away from sensitive areas. Where necessary, works should be isolated from the sensitive area using barriers, fences, screens and signage. Emergency procedures like spill contingency plans must be in place and monitoring during the construction in these areas. • The recommended construction run-off controls detailed in the EMPr must be applied prior to construction.
	<p><u>Soil profile disturbance/Soil erosion</u></p> <ul style="list-style-type: none"> • There is a risk of soil compaction, draining, drying and desiccation from stockpiling and soil profile disturbance during construction activities. • There is the potential for soil erosion to result from construction activities during clearing of natural vegetation and the exposure of soil. • There is the potential for alien vegetation to become established where areas are cleared for the establishment of the pump stations, digging of trenches, laying of pipelines and the clearing of cultivation plot boundaries, thereby exacerbating soil erosion. 	High (-)	Low (-)	<p><u>Soil profile disturbance/Soil erosion</u></p> <ul style="list-style-type: none"> • Once earthworks are complete, disturbed areas are to be stabilised to prevent erosion. • With respect to the construction of pump stations and pipeline trenching, anti-Erosion berms and water diversion berms will be installed where required and maintained throughout the construction period. • Ensure that disturbed areas are re-vegetated as soon as possible after clearing.
	<p><u>Waste management</u></p> <ul style="list-style-type: none"> • An increase in the amount of litter being generated during construction. • Non-use of sanitation facilities. 	High (-)	Low (-)	<p><u>Waste management</u></p> <ul style="list-style-type: none"> • The environmental induction training must address the management of sanitation facilities and general site management. • The site must be managed appropriately and all rubbish must be

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
				collected in appropriate waste receptacles and disposed of at the nearest landfill site.
	<u>Temporary job creation:</u> <ul style="list-style-type: none"> The proposed development will result in job provision and skills transfer. This in turn will promote the opportunity for re-employment. There will be employment opportunities for members of the local community. The community will benefit from technical training and skills development programmes which are planned through this project. Construction sites attract unemployed people, so people may gather on or around the sites looking for work. 	High (+)	High (+)	<u>Temporary job creation:</u> <ul style="list-style-type: none"> The employment must be a planned, controlled, fair and legitimate process. Construction workers should be sourced from local communities where possible. Local business should be supported, with respect to the purchase of materials, where possible.
	<u>Fire risk:</u> <ul style="list-style-type: none"> Construction workers could cause a fire on site (construction usually takes place in the dry winter months when the danger of veld fires is highest). 	Medium (-)	Low (-)	<u>Fire risk:</u> <ul style="list-style-type: none"> Workers should be made aware of the potential for fires to become out of control and the damage that could be caused. A fire response procedure should be in place.
	<u>Construction nuisance impacts include the potential for the following:</u> <ul style="list-style-type: none"> Noise from construction activities, personnel and vehicles. Dust. Security concerns. <p><i>The area is within an agricultural area, therefore, the above impacts are likely to be of low significance.</i></p>	Low (-)	Low (-)	<u>Construction nuisance impacts</u> <ul style="list-style-type: none"> Vegetation clearing on the site should take place only immediately prior to construction in order to minimise the time the soil is bare, thus minimising dust and visual impacts. Land clearing should not be conducted under windy conditions in order to minimise dust. Site workers must undergo environmental induction training before undertaking work so that they are aware of the various environmental requirements. The induction training must address keeping noise to a minimum and labourers conduct. Utilise local labour wherever possible to reduce potential friction within the community caused by bringing outside personnel in.
	<u>Heritage Impacts</u> <ul style="list-style-type: none"> Although no heritage resources have been observed on the proposed sites, it is always possible that a heritage resource could be encountered. 	Med (-)	Low(-)	<u>Heritage Impacts</u> <ul style="list-style-type: none"> Should any artefact / suspected artefact / site of cultural significance be encountered during construction, then the Contractor must cease work in that vicinity and alert the relevant authorities.
	<u>Safety of workers</u> <ul style="list-style-type: none"> Construction work poses general safety risks. 	High (-)	Low(-)	<u>Safety of workers</u> <ul style="list-style-type: none"> Potentially hazardous areas are to be cordoned off and clearly marked at all times. All vehicles and equipment used on site must be operated by appropriately trained and / or licensed personnel.

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
				<ul style="list-style-type: none"> All personnel must operate in compliance with all safety measures as laid out in the Occupational Health and Safety Act (Act No. 85 of 1993) (OHSA). The Contractor must make available safe drinking water fit for human consumption. Washing and toilet facilities must be provided on site. Adequate numbers of chemical toilets must be maintained to service the staff using this area. At least 1 toilet must be available per 20 workers. Toilet paper must be provided. Necessary Personal Protective Equipment (PPE) and safety gear appropriate to the task being undertaken is to be provided to all site personnel (e.g. hard hats, safety boots, masks etc.).
	<u>Sourcing borrow material</u> (if applicable) <ul style="list-style-type: none"> Sourcing borrow material (earth) when unavailable on-site, can have a detrimental effect on the biophysical stability of the area that it is borrowed from. 	Med (-)	Low (-)	<u>Sourcing borrow material</u> (if applicable) <ul style="list-style-type: none"> If applicable, appropriate re-sloping and re-vegetation of the area that the borrow material is acquired from must be undertaken after use.
	Indirect Impacts	Without mitigation	With mitigation	
	<u>Job creation</u> <ul style="list-style-type: none"> The potential impact of this is significant and has a number of indirect positive impacts such as improvement in quality of life of the workers, increased spending in the local economy and the support of small business in the local area. 	High (+)	High (+)	<ul style="list-style-type: none"> Ensure that the required Project workers are sourced from local communities and that maximum employment numbers are maintained throughout the Project duration. Project implementers to support local businesses where possible.
	<u>Increased awareness of environmental management through training</u> <ul style="list-style-type: none"> As an indirect impact there is likely to be some increased awareness amongst the construction teams and farmers regarding riverine ecology and the importance of rehabilitation. 	Med (+)	High (+)	<ul style="list-style-type: none"> Encourage farmers to become more aware of, and educated in, the ecological values and sensitivity of the natural environments.
	Cumulative impacts:			
	<u>Job creation/Skills development</u> <ul style="list-style-type: none"> Cumulatively, the impact of the proposed development is judged to be of high positive significance. The programme will create jobs and transfer skills to numerous previously unskilled persons. 	High (+)	High (+)	<u>Job creation/skills development</u> <ul style="list-style-type: none"> Ensure that the required construction workers are sourced from local communities and that maximum employment numbers are maintained throughout the Project. Project implementers to support local businesses where possible.

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	<u>Increased awareness of environment</u> <ul style="list-style-type: none"> The programme is creating increased awareness amongst the construction teams and farmers regarding riverine ecology, the importance of rehabilitation and the importance of protecting biodiversity. 	High (+)	High (+)	<u>Increased awareness of environment</u> <ul style="list-style-type: none"> Encourage farmers to become more aware of, and educated in, the ecological values and sensitivity of the riverine environments.
	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> Although the habitat disturbance during construction will be temporary, it can affect future floral growth and faunal breeding patterns. 	High (-)	Low(-)	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> Mitigation measures detailed in the 'direct impact' section above must be followed to avoid cumulative impacts.
	<u>Aquatic eco-system impacts</u> <ul style="list-style-type: none"> Soil erosion and additional sediment which enters the watercourse during construction of the irrigation infrastructure and plots could result in the build-up of silt downstream, and thus the increase in water turbidity, both affecting the aquatic eco-systems, medium and long term. 	High (-)	Low(-)	<ul style="list-style-type: none"> Mitigation measures detailed in the 'direct impact' section above must be followed to avoid cumulative impacts.
	<u>Soil profile/Erosion</u> <ul style="list-style-type: none"> Potential for alien vegetation, which may become established on the cleared sites, to spread to other natural areas. Stormwater runoff during construction has the potential to erode topsoil and result in sedimentation of water courses if not controlled. Continued soil erosion, as a result of the removal of natural vegetation could eventually degrade the river system downstream. 	High (-)	Low(-)	<u>Soil profile/Erosion</u> <ul style="list-style-type: none"> Mitigation measures detailed in the 'direct impact' section above must be followed to avoid cumulative impacts.
No-go option				
<i>Direct, Indirect and Cumulative impacts:</i>				
	<u>Socio-economic</u> Agriculture will continue to be the preferred activity in the area as the rivers naturally attract the communities with their water supply. The lack of a more sophisticated method of harnessing the river water for irrigation purposes results in a less successful agricultural yield and contributes to the poverty currently being experienced in the area. Without an irrigation scheme, poverty will thus continue to be an issue for the area. <u>Disadvantages of the no-go option</u> <u>If the proposed irrigation scheme is not delivered to the area then:</u> <ul style="list-style-type: none"> The aim of the CRDP to provide support that leads to sustainable, 	N/A	N/A	N/A

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	<p>equitable and vibrant rural communities through infrastructural assistance would not be realised through assistance to the communities of Nkandla, one of the poorest rural wards in South Africa.</p> <ul style="list-style-type: none"> • Resulting social and economic upliftment through the CRDP would not occur. • Resulting food gardens would not be established by the CRDP. • Skills for correct soil management within the area will not be taught and transferred within the community through the CRDP. <p><u>Advantages of the no-go option</u> <u>If the proposed irrigation scheme is not delivered to the area then:</u></p> <ul style="list-style-type: none"> • There are none identified. <p><u>Biophysical</u> The area suffers from high erosion and river sedimentation through disturbance of the natural areas without robust land management practices.</p> <p><u>Disadvantages of the no-go option</u></p> <ul style="list-style-type: none"> • Soil erosion is likely to persist without the CRDP intervention. • The high siltation rates currently found within the Rivers due to soil erosion may persist without CRDP intervention. • There is a lost opportunity for the environment surrounding the NFEPA identified systems of the Tugela and the Nsuze to have a managed approach with interventions from environmental professionals. <p><u>Advantages of the no-go option</u> <u>If the proposed irrigation scheme is not delivered to the area then:</u></p> <ul style="list-style-type: none"> • there is less risk of pollutants from agriculture (fertilisers and pesticides) from entering the watercourses. • there is less risk of foreign materials being introduced; • there is less risk of soil disturbance and soil compaction; • there is less risk of increased surface run-off from vegetation loss; and; • there is less risk of increased erosion if soils are not protected (although the irrigation of the soil itself, will not increase risk of erosion). 			

BASIC ASSESSMENT REPORT

B) Operational Phase

Activity	Impact summary	Significance		Proposed mitigation
		Without mitigation	With mitigation	
	Direct impacts:			
	<u>Operation of pump stations, reservoirs and cultivated areas</u> <ul style="list-style-type: none"> The cultivation of the plots and the maintenance of irrigation infrastructure may result in the risks listed below: <ul style="list-style-type: none"> ➢ Aquatic ecosystem impacts ➢ Flora and Fauna disturbance ➢ Soil profile disturbance and soil erosion 	High (-)	Low (-)	<ul style="list-style-type: none"> Where interventions are required for maintenance such that potential risks listed in the construction phase above would be triggered, then associated mitigations listed above must apply e.g. soil stabilisation if reconstruction of a concrete base is required.
	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> There is the continued risk of potential alien vegetation to colonise and dominate the area, thus contributing to the reduction of habitats for flora and fauna. After construction, there is the potential for the community to neglect to adhere to the buffer zones causing disturbance to the natural ecosystems. Habitat disturbance can affect floral growth and faunal breeding patterns. 	High (-)	Low (-)	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> An on-going alien vegetation control programme must be implemented after construction, on the site. The buffer zones must continue to be respected at all times. Monitoring of the area to determine rehabilitation progress will be necessary and details for this are provided in the EMPr.
	<u>Aquatic eco-system impacts</u> <ul style="list-style-type: none"> When maintenance is being carried out to irrigation infrastructure, there is the potential for contamination of the river, aquatic ecosystems and drainage lines at the various locations where infrastructure intersects with the hydrological features. Pollution from maintenance-related activities could enter the ecosystem (litter, fuel leaks, lubricating fluid spills, litter, cement and contaminated wash-down water). Potential of contamination of the drainage lines to the rivers, and the impact on downstream water users if a robust storm water management plan is not in place during operation. 	High (-)	Low (-)	<u>Aquatic eco-system impacts</u> <ul style="list-style-type: none"> Farmers must undergo environmental induction training before cultivation so that they are aware of the various environmental requirements. The induction training must address the risks of potential contamination to aquatic ecosystems from pollution (see waste management below). There must be no polluting of watercourses, whether flowing or not and farming vehicles must not drive through the watercourses The buffer zones must be respected at all times. Areas of high risk should be located away from sensitive areas. E.g. storing of pesticides. Where necessary, works should be isolated from the sensitive area using barriers, fences, screens and signage. Emergency procedures like spill contingency plans must be in place.
	<u>Soil profile disturbance/Soil erosion</u> <ul style="list-style-type: none"> Without soil and stormwater management structures, the risk of erosion will remain high. 	High (-)	Low (-)	<u>Soil profile disturbance/Soil erosion</u> <ul style="list-style-type: none"> Appropriate erosion and stormwater management structures must be installed around the cultivation sites. Stormwater should

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	<ul style="list-style-type: none"> There is the continued risk of potential alien vegetation to colonise and dominate the area, thus contributing to soil erosion. 			be channelled into existing natural drainage lines. Any stormwater runoff from higher-lying areas should be directed into a stormwater furrow of adequate size, towards a safe collection point where no erosion will take place. <ul style="list-style-type: none"> Erosion must be contained and prevented on an on-going basis. On-going rehabilitation of disturbed areas must adhere to the rehabilitation guidelines provided in the EMPr.
	<u>Waste management</u> <ul style="list-style-type: none"> Litter can cause pollution and negatively impact the natural areas. 	High (-)	Low (-)	<u>Waste management</u> <ul style="list-style-type: none"> The environmental induction training for farmers must address the management of general waste. General waste must be collected in appropriate waste receptacles and disposed of at the nearest landfill site.
	<u>Fire management:</u> <ul style="list-style-type: none"> Incorrect application of fire management in the area could reduce the potential for the vegetation to establish. Flora and fauna need the opportunity to seed and breed respectively. Burning regimes that are too frequent can lead to impairing the habitats ability to renew itself. 	High (-)	Low (-)	<ul style="list-style-type: none"> The rehabilitated areas must not be mowed, grazed or burned until the end of the second growing season after sowing.
	<u>Permanent job creation (self-employed/co-operative):</u> <ul style="list-style-type: none"> The proposed development will result in permanent job provision and skills transfer for members of the local community. The community will benefit from technical training and skills development programmes which are planned through this project. 	High (+)	High (+)	<u>Permanent job creation:</u> <ul style="list-style-type: none"> Local business should continue to be supported, with respect to the purchase of materials, where possible.
	<u>Food security</u> <ul style="list-style-type: none"> The proposed irrigation will result in more reliable and higher yields of crop, hence increasing food security in the area and, where there is surplus, providing an income to the farmer. 	High (+)	High (+)	N/A
	<u>Heritage Impacts</u> <ul style="list-style-type: none"> Heritage resources have been observed adjacent to some sites, and may be vulnerable. 	Med (-)	Low (-)	<u>Heritage Impacts</u> <ul style="list-style-type: none"> Buffer zones of heritage sites should continue to be adhered to. Education of farmers on the benefits of protecting heritage resources should be provided.
	<u>Monitoring and Management:</u> <ul style="list-style-type: none"> The monitoring and management of the irrigation and cultivation should be conducted, at agreed frequencies, after the proposed irrigation scheme has been implemented, for a prescribed length of time. Lessons learnt from monitoring efforts can provide evidence based justification for the improvement of similar project 	Low (+)	High (+)	<u>Monitoring and management should include the following:</u> <ul style="list-style-type: none"> Visual habitat assessment. Vegetation sample plots. Water Quality Monitoring. Regular inspections of rehabilitation interventions.

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	implementation elsewhere.			
	Indirect Impacts			
	<u>Job creation</u> <ul style="list-style-type: none"> The potential impact of this is significant and has a number of indirect positive impacts, such as improvement in quality of life of the farmers, increased spending in the local economy and the support of small business in the local area. 	High (+)	High (+)	<ul style="list-style-type: none"> Project implementers to support local businesses where possible e.g. maintenance of infrastructure.
	<u>Increased awareness of environmental management through training</u> <ul style="list-style-type: none"> As an indirect impact there is likely to be some increased awareness amongst farmers regarding riverine ecology and the importance of rehabilitation. 	High (+)	High (+)	<ul style="list-style-type: none"> Encourage farmers to become more aware of, and educated in, the ecological values and sensitivity of the natural environments.
	Cumulative impacts:			
	<u>Job creation/Skills development</u> <ul style="list-style-type: none"> Cumulatively, the impact of the proposed development is judged to be of high positive significance. The programme will create jobs and transferred skills to numerous previously unskilled persons. 	High (+)	High (+)	N/A
	<u>Increased awareness of environment</u> <ul style="list-style-type: none"> The programme is creating increased awareness amongst the farmers regarding riverine ecology, the importance of rehabilitation and the importance of protecting biodiversity. 	High (+)	High (+)	<u>Increased awareness of environment</u> <ul style="list-style-type: none"> Encourage farmers to become more aware of, and educated in, the ecological values and sensitivity of the riverine environments.
	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> Habitat disturbance can affect floral growth and faunal breeding patterns. 	High (-)	Low(-)	<u>Flora and Fauna disturbance</u> <ul style="list-style-type: none"> Mitigation measures detailed in the 'direct impact' section above must be followed to avoid cumulative impacts.
	<u>Aquatic eco-system impacts</u> <ul style="list-style-type: none"> Soil erosion and additional sediment which enters the watercourse during maintenance of the irrigation infrastructure and cultivation of the plots could result in the build-up of silt downstream, and thus the increase in water turbidity, both affecting the aquatic eco-systems medium and long term. Potential for prolonged contamination of the downstream water systems and their subsequent degradation over time, if pesticides are not properly selected and applied. 	High (-)	Low(-)	<ul style="list-style-type: none"> Mitigation measures detailed in the 'direct impact' section above must be followed to avoid cumulative impacts.
	<u>Soil profile/Erosion</u> <ul style="list-style-type: none"> Potential for alien vegetation, which may become established, to spread to other natural areas. 	High (-)	Low(-)	<u>Soil profile/Erosion</u> <ul style="list-style-type: none"> Mitigation measures detailed in the 'direct impact' section above must be followed to avoid cumulative impacts

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	<ul style="list-style-type: none"> Stormwater runoff has the potential to erode topsoil and result in sedimentation of water courses if not controlled. Continued soil erosion, as a result of the removal of natural vegetation could eventually degrade the river system downstream. 			
	No-go option			
	<i>Direct, Indirect and Cumulative impacts:</i>			
	<p><u>economic</u> Agriculture will continue to be the preferred activity in the area as the rivers naturally attract the communities with their water supply. The lack of a more sophisticated method of harnessing the river water for irrigation purposes results in a less successful agricultural yield and contributes to the poverty currently being experienced in the area. Without an irrigation scheme, poverty will thus continue to be an issue for the area.</p> <p><u>Disadvantages of the no-go option</u> If the proposed irrigation scheme is not delivered to the area then:</p> <ul style="list-style-type: none"> The aim of the CRDP to provide support that leads to sustainable, equitable and vibrant rural communities through infrastructural assistance would not be realised through assistance to the communities of Nkandla, one of the poorest rural wards in South Africa. Resulting social and economic upliftment through the CRDP would not occur. Resulting food gardens would not be established by the CRDP. Skills for correct soil management within the area will not be taught and transferred within the community through the CRDP. <p><u>Advantages of the no-go option</u> If the proposed irrigation scheme is not delivered to the area then:</p> <ul style="list-style-type: none"> There are none identified. <p><u>Biophysical</u> The area suffers from high erosion and river sedimentation through disturbance of the natural areas without robust land management practices.</p> <p><u>Disadvantages of the no-go option</u></p> <ul style="list-style-type: none"> Soil erosion is likely to persist without the CRDP intervention. The high siltation rates currently found within the Rivers due to soil 	N/A	N/A	N/A

BASIC ASSESSMENT REPORT

Activity	Impact summary	Significance		Proposed mitigation
	<p>erosion may persist without CRDP intervention.</p> <ul style="list-style-type: none"> • There is a lost opportunity for the environment surrounding the NFEPA identified systems of the Tugela and the Nsuze to have a managed approach with interventions from environmental professionals. <p><u>Advantages of the no-go option</u></p> <p><u>If the proposed irrigation scheme is not delivered to the area then:</u></p> <ul style="list-style-type: none"> • there is less risk of pollutants from agriculture (fertilisers and pesticides) from entering the watercourses. • there is less risk of foreign materials being introduced; • there is less risk of soil disturbance and soil compaction; • there is less risk of increased surface run-off from vegetation loss; and; • there is less risk of increased erosion if soils are not protected (although the irrigation of the soil itself, will not increase risk of erosion). 			

BASIC ASSESSMENT REPORT

C) Decommissioning and Closure Phase

Activity	Impact summary	Significance		Proposed mitigation
		Without mitigation	With mitigation	
	Direct impacts:			
	<ul style="list-style-type: none"> If the activity is decommissioned, then there is an opportunity to reinstate the natural habitats. This would have a positive impact for vegetation and fauna in the area and contribute to restoring ecological corridors on a broader scale. Alien vegetation could become established on the sites if not properly managed. Soil erosion could occur on the sites if not properly managed, and cause sedimentation to the downstream water systems. If the activity is decommissioned, then the Farmers would lose their livelihoods. If these people were not able to find other jobs, then there would be a negative impact on the community as one job typically supports 7 dependents in KZN. If the cultivation is decommissioned then agricultural production will decrease and there is a risk to food security. 	High (-)	Low (-)	<ul style="list-style-type: none"> Should the Plots be decommissioned, an adequate cover crop must be planted to stabilise the soil, in order to prevent erosion. Erosion control structures would have to be installed. The site should be allowed to rehabilitate naturally. Alien invasive plants should be continually cleared and not allowed to establish. An Alien Vegetation Control Programme would have to be implemented on site.
	Indirect Impacts			
	<ul style="list-style-type: none"> The agricultural service sector in the area would be negatively impacted by the decommissioning of the activity. 	High (-)	High (-)	
	Cumulative impacts:			
	<ul style="list-style-type: none"> Unemployment in the area could become exacerbated if there are no opportunities for new employment offered. There is the potential for crime to increase as unemployed people are forced to make choices that they would not normally have made, as a way to obtain money to buy food for their families. 	High (-)	High (-)	N/A
	No-go option			
	Direct, Indirect and Cumulative impacts:			
	The no-go alternative is retaining the sites in their natural state, therefore decommissioning of these sites in their natural state is not applicable.	N/A	N/A	N/A

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (preferred alternative)

Table 9: Environmental impact risk assessment (probability and significance)

Type of impact	Negative/Positive environmental impact	Likelihood of potential impacts occurring	Duration of impact	Significance of impact
Construction				
Temporary employment and up-skilling	Positive	Certain	Temporary	High
Flora and Fauna disturbance	Negative	Low probability	Temporary	Low
Aquatic ecosystem impacts	Negative	Low probability	Temporary	Low
Soil profile disturbance and soil erosion	Negative	Low probability	Temporary	Low
Waste management	Negative	Low probability	Temporary	Low
Fire risk	Negative	Low probability	Temporary	Low
Construction nuisance	Negative	Low probability	Temporary	Low
Heritage	Negative	Low probability	Temporary	Low
Safety	Negative	Low probability	Temporary	Low
Sourcing borrow material (if applicable)	Negative	Low probability	Temporary	Low
Operational				
Permanent job provision	Positive	Certain	Long-term	High
Training and development of farmers	Positive	Certain	Long-term	High
Food security (reduction in poverty, increase in quality of life)	Positive	High probability	Long-term	High
Flora and Fauna disturbance	Negative	Low probability	Long-term	Low
Aquatic ecosystem impacts	Negative	Low probability	Long-term	Low
Soil profile disturbance and soil erosion	Negative	Low probability	Long-term	Low
Waste management	Negative	Low probability	Long-term	Low
Fire risk	Negative	Low probability	Long-term	Low
Heritage	Negative	Low probability	Long-term	Low

BIO-PHYSICAL IMPACTS

Biodiversity Assessment

The Biodiversity Assessment identified environmentally sensitive areas (erosion features and areas sensitive to erosion, riverine habitats, areas rich in biodiversity, ecological corridors, and areas with floral species of conservational importance). These areas have specifically been excluded from the proposed site footprints and the recommended buffers to protect those areas identified have been applied. A plant rescue programme should be conducted on the sites prior to the commencement of vegetation clearing. Plants identified as having conservation significance should be relocated to areas outside the proposed area to be cultivated.

Recommendations and additional measures to protect flora and fauna from disturbance during the construction and operational phases have been included in the EMPr (Appendix G).

Freshwater Ecosystem/Wetland Delineation Report

The Freshwater Ecosystem/Wetland Delineation Assessment identified environmentally sensitive hydrological features (drainage channels, wetlands, streams and rivers). These areas have been specifically excluded from the proposed site footprints and a 50m buffer (comprising a filter strip of natural vegetation to ensure an undisturbed vegetative community). Recommendations and additional measures to protect aquatic ecosystems from degradation during the construction and operational phases have been included in the EMPr. In addition, the development of the following management plans are a recommendation of this Report

- Agricultural run-off control management plan for plots during cultivation.
- Riparian Habitat Rehabilitation (and on-going management) Plan that includes deactivation of erosion features, reduces silt export from the system and eradication of alien vegetation.

Heritage Impact Assessment

The HIA identified areas of heritage significance. These areas have been specifically excluded from the proposed plots. A 100m buffer has been applied between the heritage sites and plot numbers 1, 28 and 31.

Water Resource Assessment

The Water Resource Assessment has found that there is water available from the river systems to support the irrigation scheme. A Water Use License is currently being applied for.

Agricultural Potential Assessment

The Agricultural Potential Assessment identified soils that were suitable/ unsuitable for cultivation. The proposed plots have soils with high agricultural potential.

SOCIO-ECONOMIC IMPACTS

The reduction of poverty and inequality are critical issues facing South-Africa, especially for the poorer areas. Nkandla, in KwaZulu-Natal has been identified as an area worthy of intervention because of the low levels of unemployment and lack of access to areas that are developed or proposed to be developed in the future. The agricultural sector has been identified (PSDF) as having the ability to provide an economic growth opportunity whilst ensuring food security and associated quality of living, which is the primary goal. However, agricultural areas face challenges, and these areas require transformation measures to enable agricultural yields to rise above threshold levels. The DRDLR investment programme, in support of this goal, is proposing to establish an irrigation scheme for food gardens along the Nsuze/Tugela rivers in the Nkandla area.

CONCLUSION

It must be reiterated that the area is an existing agricultural subsistence farming area. There are existing environmental issues associated to current agricultural practices within the area. Soil erosion is the chief concern. There is an opportunity for this area to be provided with upliftment through the installation of modern irrigation systems for cultivation, with training and development provided by the DRDLR. This is an invaluable investment opportunity for a region which cannot benefit from other provincial economic corridor development, due to its rural location. The area has a valuable water resource available to it, to enable the community to at least subsist and create a local food market through surplus. The rivers are of high conservation importance and therefore, environmental control of activities which may impact the status of the rivers is critical. The plots proposed in this Report exclude all areas of environmental sensitivity. However, some habitat loss will occur during the establishment of river abstraction pump stations which are proposed within the river buffer zone. This, along with other temporary construction related risks associated with the implementation of the Nsuze Irrigation Scheme can be adequately mitigated against. The realisation of the potential negative environmental impacts which could result from the cultivation of the proposed plots, identified in this Report, are directly dependent on the correct application of the operational management measures recommended by this Report. Thus, provided that they are applied and there is a monitoring process to enforce corrective action, then the overwhelming and nationally important positive impacts of the provision of food to this poor area, will far outweigh the risk to the environment.

No-go alternative (compulsory)

If the no go alternative is pursued the disturbance to the natural habitat, albeit degraded, will be avoided, however, the operational-related impacts will then not be realised which in this case will mean that the important goal of hunger, poverty and disease alleviation will not be able to be achieved through the provision of the Nsuze Irrigation Scheme. The proposed development area is not close to a development node and thus will require intervention to address spatial inequity and political inequalities of the past.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	
-----	--

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

<p>The development of the following <u>management plans</u> are a recommendation of this Report:</p> <ul style="list-style-type: none"> • Agricultural run-off control management plan for plots during cultivation. • Riparian Habitat Rehabilitation (and on-going management) Plan that includes deactivation of erosion features, reduces silt export from system and eradication of alien vegetation. <p>CONSTRUCTION</p> <ul style="list-style-type: none"> • Before commencing with any work, all staff members must be appropriately briefed about the potential environmental impacts from construction, the EMPr and relevant occupational health and safety issues. <p><u>Flora and fauna disturbance</u></p> <ul style="list-style-type: none"> • A plant rescue programme should be conducted on the property prior to the commencement of vegetation clearing. Any plants identified as having conservation significance should be relocated to areas outside the proposed development footprint. • Indigenous vegetation must be stockpiled for reuse for rehabilitation when construction is complete • Damage to the habitats must be kept to a minimum to prevent loss of species, soil erosion and sediment pollution from run-off. Thus, unnecessary clearing of vegetation must be avoided and a phased approach to the clearing should be adopted to limit extended periods of ground exposure. Clearing should also be avoided during sensitive periods of the year • Vegetation clearing on the site should also only take place immediately prior construction to minimise dust, soil erosion and the potential for alien vegetation to become established. • An alien vegetation control programme must be implemented on the site (refer to EMPr, Appendix G). • The rehabilitation of disturbed areas must adhere to the rehabilitation guidelines provided in the EMPr. • The buffer zones must be respected at all times. The buffer zones must be accurately pegged before construction occurs. <p><u>Aquatic eco-system impacts</u></p> <ul style="list-style-type: none"> • Site workers must undergo environmental induction training before undertaking work so that they are aware of the various environmental requirements. The induction training must address the risks of potential contamination to aquatic ecosystems from construction pollution. • There must be no polluting of watercourses, whether flowing or not and construction vehicles must not drive through the watercourses • The cutting of the banks of any watercourses for thoroughfare must be avoided. Crossings for drainage lines and perennial/non-perennial streams must be considered by the Engineer in consultation with an Environmental Specialist, prior to construction. Where fringe wetlands are encountered these may need to be deviated around. • Bank destabilisation during construction will require additional stabilisation measures while the bank is rehabilitated, especially if there is a risk of raised water levels. • Soil used in interventions must be stabilised. Support must be provided to river banks/drainage slopes during construction to prevent the movement of soil and sediment deposition into the river.
--

BASIC ASSESSMENT REPORT

- Where sand bags are used to support natural areas whilst construction is undertaken, earth that is used to fill sand bags should come from and be returned to the designated existing excavation points.
- Sandbags, if used must be in a good condition, so that they do not burst.
- Most pollution incidents can be avoided through identification of potential sources of pollution and appropriate environmental awareness and staff training. Areas of high risk should be located away from sensitive areas. Where necessary, works should be isolated from the sensitive area using barriers, fences, screens and signage. Emergency procedures, like spill contingency plans, must be in place and monitoring during the construction in these areas.

Soil profile disturbance/Soil erosion

- Once earthworks are complete, disturbed areas are to be stabilised to prevent erosion.
- With respect to the construction of pump stations and pipeline trenching, anti-Erosion berms and water diversion berms will be installed where required and maintained throughout the construction period.

Waste management

- The environmental induction training must address the management of sanitation facilities and general site management.
- The site must be managed appropriately and all rubbish and rubble must be collected in appropriate waste receptacles and disposed of at the nearest landfill site.

Temporary job creation

- The employment must be a planned, controlled, fair and legitimate process.
- Construction workers should be sourced from local communities where possible.
- Local business should be supported, with respect to the purchase of materials, where possible.

Fire risk

- Workers should be made aware of the potential for fires to become out of control and the damage that could be caused.
- A fire response procedure should be in place.

Construction nuisance impacts

- Vegetation clearing on the site should take place only immediately prior to construction in order to minimise the time the soil is bare, thus minimising dust and visual impacts.
- Land clearing should not be conducted under windy conditions in order to minimise dust.
- Site workers must undergo environmental induction training before undertaking work so that they are aware of the various environmental requirements. The induction training must address keeping noise to a minimum and labourers conduct.

Heritage Impacts

- Should any artefact / suspected artefact / site of cultural significance be encountered during construction, then the Contractor must cease work in that vicinity and alert the relevant authorities.

Safety of workers

- The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act (Act No. 85 of 1993) and the National Building Regulations.
- All vehicles and equipment used on site must be operated by appropriately trained and / or licensed personnel.
- The Contractor must make available safe drinking water fit for human consumption.
- Washing and toilet facilities must be provided on site.
- Adequate numbers of chemical toilets must be maintained to service the staff using this area. At least 1 toilet must be available per 20 workers. Toilet paper must be provided.
- Necessary Personal Protective Equipment (PPE) and safety gear appropriate to the task being undertaken is to be provided to all site personnel (e.g. safety boots, masks etc.).

Sourcing borrow material (if applicable)

- If applicable, appropriate re-sloping and re-vegetation of the area that the borrow material is acquired from must be undertaken after use.

OPERATION

Flora and Fauna disturbance

- An on-going alien vegetation control programme must be implemented after construction, on the site (refer to EMP, Appendix G).

BASIC ASSESSMENT REPORT

- The buffer zones must continue to be respected at all times.
- Monitoring of the area to determine rehabilitation progress will be necessary and details for this are provided in the EMPr (Appendix G).

Soil profile disturbance/Soil erosion

- On-going rehabilitation of disturbed areas must adhere to the rehabilitation guidelines provided in the EMPr (Appendix G).

Waste management

- The environmental induction training for farmers must address the management of sanitation facilities and general waste management.
- General waste must be collected in appropriate waste receptacles and disposed of at the nearest landfill site.

Fire management

- The rehabilitated areas must not be mowed, grazed or burned until the end of the second growing season after sowing.

Heritage Impacts

- Buffer zones of heritage sites should continue to be adhered to.
- Education of farmers on the benefits of protecting heritage resources should be provided.

Monitoring and management should include the following:

- Visual habitat assessment.
- Vegetation sample plots.
- Water Quality Monitoring.
- Regular inspections of rehabilitation interventions.

Sustainable local economy

- Project implementers to support local businesses where possible e.g. maintenance of infrastructure.

Environmental awareness

- Encourage farmers to become more aware of, and educated in, the ecological values and sensitivity of the natural environments.

Is an EMPr attached?

YES

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

NAME OF EAP

SIGNATURE OF EAP

DATE

SECTION F: APPENDICES

- Appendix A: Maps
- Appendix B: Photographs
- Appendix C: Facility illustration(s)
- Appendix D: Specialist reports (including terms of reference)
- Appendix D1 Biodiversity Assessment
- Appendix D2 Freshwater Ecosystem/Wetland Delineation Report
- Appendix D3 Heritage Impact Assessment
- Appendix D4 Water Resource Assessment
- Appendix E: Public Participation
- Appendix F: Impact Assessment
- Appendix G: Environmental Management Programme (EMPr)
- Appendix H: Details of EAP and expertise
- Appendix I: Specialist's declaration of interest
- Appendix J: Additional Information

- Table 1: Nsuze Irrigation Scheme - non-sensitive sites
- Table 2: Nsuze Irrigation Scheme –pump stations
- Table 3: List of non-sensitive plots
- Table 4: Sites identified for river abstraction pump stations (RA)
- Table 5: Sites identified for booster - pump stations (BPSD)
- Table 6: Sites identified for reservoirs
- Table 7: Sites identified for cultivation plots
- Table 8: Sites which excluded areas for heritage resources
- Table 9: Environmental impact risk assessment (probability and significance)

Figure 1: Nkandla SDF demonstrating no environmental constraints for proposed site area