environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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Tel (+ 27 12) 399 9372

NEAS Reference: DEA/EIA/0002386/2014
DEA Reference: 14/12/16/3/3/2/677
Enquiries: Ms Sindiswa Dlomo
Telephone: 012-399-9390 **E-mail:** Sdlomo@environment.gov.za

Mr Menard Mugumo
Department of Water and Sanitation
Private Bag X313
PRETORIA
0001

Tel: (012) 336-6838
E-mail: Mugumom@dwa.gov.za

Dear Mr Mugumo

APPLICATION FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998: GN R. 543/544/546: PROPOSED CONSTRUCTION OF THE MZIMVUBU WATER PROJECT: PROPOSED NTABELANGA - LALENI CONJUNCTIVE SCHEME AND ASSOCIATED INFRASTRUCTURE.

With reference to the above application, please be advised that the Department has decided to accept the final EIAr and also grant environmental authorisation. The environmental authorisation (EA) and reasons for the decision are attached herewith.

In terms of regulation 10(2) of the Environmental Impact Assessment Regulations, 2010 (the Regulations), you are instructed to notify all registered interested and affected parties, in writing and within 12 (twelve) days of the date of the EA, of the Department's decision in respect of your application as well as the provisions regarding the submission of appeals that are contained in the Regulations.

Your attention is drawn to Chapter 7 of the Regulations, which prescribes the appeal procedure to be followed. This procedure is summarised in the attached document. Kindly include a copy of this document with the letter of notification to interested and affected parties.

Should the applicant or any other party wish to appeal any aspect of the decision a notice of intention to appeal must be lodged by all prospective appellants with the Minister, within 20 days of the date of the EA, by means of one of the following methods:

By post: Private Bag X447,
Pretoria, 0001; or
By hand: Environment House
473 Steve Biko,
Arcadia,
Pretoria, 0083

If the applicant wishes to lodge an appeal, it must also serve a copy of the notice of intention to appeal on all registered interested and affected parties as well as a notice indicating where, and for what period, the appeal submission will be available for inspection, should you intend to submit an appeal.

Appeals must be submitted in writing to:

Mr Z Hassam Director: Appeals and Legal Review, of this Department at the above mentioned addresses or fax number. Mr Hassam can also be contacted at:

Tel: (012) 399 9356
Email: AppealsDirectorate@environment.gov.za

The authorised activities shall not commence within twenty (20) days of the date of signature of the environmental authorisation. Further, please note that in terms of section 43(7) of the National Environmental Management Act, 1998, an appeal under section 43 of that Act will suspend the environmental authorisation or any provision or condition attached thereto. In the instance where an appeal is lodged, you may not commence with the activity until such time that the appeal is finalised.

Yours sincerely

Mr Sabelo Malaza
Chief Director: Integrated Environmental Authorisations
Department of Environmental Affairs
Date: 17/06/2015

CC:	Ms L Muruvan	ILISO Consultancy (Pty) Ltd	Tel: 012-685-0900	Email: Lea@iliso.com
	Mr A Mfenyana	Provincial DEAET	Tel: 043-605-7011	Email: albert.mfenyana@deaet.ecape.gov.za
	Mr MZ Silinga	Alfred Nzo District Municipality	Tel: 039-254-5009	Email: ngqokom@andm.gov.za
	Mr ZA Williams	Joe Gqabi District Municipality	Tel: 045-979-3006	Email: mm@jgdm.gov.za
	Mr N Hlazo	OR Tambo District Municipality	Tel: 074-501-6407	Email: ayandaw@ortambodm.org.za

APPEALS PROCEDURE IN TERMS OF CHAPTER 7 OF THE NEMA EIA REGULATIONS, 2010 (THE REGULATIONS) AS PER GN R. 543 OF 2010 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF AN ENVIRONMENTAL AUTHORISATION (EA)

APPLICANT	INTERESTED AND AFFECTED PARTIES (IAPs)
1. Receive EA from the relevant Competent Authority (the Department of Environmental Affairs [DEA]).	1. Receive EA from Applicant/Consultant.
2. Within 12 days of date of the EA notify all IAPs of the EA and draw their attention to their right to appeal against the EA in terms of Chapter 7 of the Regulations.	2. N/A.
3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA with the Minister of Environmental Affairs (the Minister).	3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA with the Minister of Environmental Affairs (the Minister).
4. After having submitted your notice of intention to appeal to the Minister, provide each registered IAP with a copy of the notice of intention to appeal within 10 days of lodging the notice.	4. After having submitted your notice of intention to appeal to the Minister, provide the applicant with a copy of the notice of intention to appeal within 10 days of lodging the notice.
5. The Applicant must also serve on each IAP: • a notice indicating where and for what period the appeal submission will be available for inspection.	5. Appellant must also serve on the Applicant within 10 days of lodging the notice, • a notice indicating where and for what period the appeal submission will be available for inspection by the applicant.
6. The appeal must be submitted in writing to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.	6. The appeal must be submitted to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.
7. Any IAP who received a notice of intention to appeal may submit a responding statement to that appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.	7. An Applicant who received notice of intention to may submit a responding statement to the appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.

NOTES:

1. **An appeal must be:-**
   a) submitted in writing;
   b) accompanied by:
   - a statement setting out the grounds of appeal;
   - supporting documentation which is referred to in the appeal; and
   - a statement that the appellant has complied with regulation 62 (2) or (3) together with copies of the notices referred to in regulation 62.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Environmental Authorisation

In terms of regulation 36 of the Environmental Impact Assessment Regulations, 2010

The construction of the Mzimvubu Water Project: Ntabelanga - Lalini Conjunctive Scheme and associated infrastructure

OR Tambo, Alfred Nzo and Joe Gqabi District Municipalities

Authorisation register number:	*14/12/16/3/3/2/677*
NEAS reference number:	*DEA/EIA/0002386/2014*
Last amended:	*First issue*
Holder of authorisation:	*Department of Water and Sanitation*
Location of activity:	*EASTERN CAPE PROVINCE: Within the Alfred Nzo, Elundini, Mhlonto, Nyandeni, Ntabankulu, and Umzimvubu Local Municipalities.*

This environmental authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activity.

Decision

The Department is satisfied, on the basis of information available to it and subject to compliance with the conditions of this environmental authorisation, that the applicant should be authorised to undertake the activities specified below.

Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the EIA regulations.

Details regarding the basis on which the Department reached this decision are set out in Annexure 1.

Activities authorised

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No.107 of 1998) and the Environmental Impact Assessment Regulations, 2010 the Department hereby authorises –

DEPARTMENT OF WATER AND SANITATION

with the following contact details –

Mr Menard Mugumo
Department of Water and Sanitation
Private Bag X313
PRETORIA
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Tel: (012) 336-6838
Fax: (012) 336-7399
Cell: (082) 804-5162
E-mail: Mugumom@dwa.gov.za

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to undertake the following activities (hereafter referred to as "the activity") indicated in Listing Notice 1, Listing Notice 2 and Listing Notice 3 (GN R. 544, 545 & 546):

Listed activities	**Activity/Project description**
GN R. 544 Item 09: *The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water , sewage or storm water -* *(i) With an internal diameter of 0,36 metres or more; or* *(ii) With a peak throughput of 120 litres per second or more*	The project involves the construction of potable water and raw water pipelines
GN R. 544 Item 10: *The construction of facilities and infrastructure for the transmission and distribution of electricity –* *Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts…."*	The construction of a 132kv overhead power line from the solar facility to the existing Eskom electricity grid. The construction of step-up transformers and a substation to transmit and distribute the electricity generated.
GN R.544 Item 11: *The construction of:* *(iii) bridges;* *(iv) dams;* *(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, excluding where such construction will occur behind the development setback line.*	The project involves the construction of two (2) dams. Two (2) bridges crossing the Tsitsa River will have to be demolished and relocated or raised. Gauging stations are planned as part of the project. River intake structures will be built as part of the irrigation scheme.
GN R.544 Item 12: *The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010.*	The project includes the construction of treated water reservoirs, as part of the potable water bulk infrastructure.
GN R.544 Item 18: *The infilling or depositing of any material of more than 5 cubic metres into, or*	Construction of the dams will involve infilling material into the

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Listed activities	Activity/Project description
the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from: *(i) a watercourse*	Tsitsa River.
GN R.544 Item 22: *The construction of a road, outside urban areas,* *(i) with a reserve wider than 13,5 meters or,* *(ii) where no reserve exists where the road is wider than 8 metres, or* *(iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010*	Existing district roads inside the two dams' footprint will need to be rerouted as they will be inundated. New access roads will also be built in order to facilitate access to the sites during construction (**Roads**).
GN R.545 Item 19: *The construction of a dam, where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more.*	Both the Ntabelanga and Lalini Dams trigger this activity. The maximum dam wall height for the Ntabelanga Dam is 67 m; the inundated area upstream at maximum flood level will be approximately 40 km^2. The maximum dam wall height for the Lalini Dam is 32 m; the inundated area upstream at maximum flood level will be approximately 15 km^2.
GN R.545 Item 1: *The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.*	The hydropower plant at Ntabelanga Dam will generate an average of 2.1 MW and the plant at Lalini Dam will generate up to 30 MW average output. Combined scheme output is an average of 32 MW or up to 180 MW peaking power.

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Listed activities	Activity/Project description
GN R.546 Item 2: *The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.* *ii. In a protected area identified in terms of NEMPAA, excluding conservancies;* *iii. Outside urban areas, in:* *(dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	Some reservoirs will fall within Critical biodiversity areas.
GN R.546 Item 13: *The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation,* ***(a)** Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.* ***(c) In Eastern Cape,:*** *ii. Outside urban areas, the following:* *(bb) National Protected Area Expansion Strategy Focus areas;*	Vegetation clearance for construction of the two dams and associated infrastructure and borrow areas within Critical biodiversity areas
GN R.546 Item 16: *The construction of:* *(iv) infrastructure covering 10 square metres or more* *where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.* ***(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape:*** *ii. Outside urban areas, in:* *(bb) National Protected Area Expansion Strategy Focus areas;* *(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	Some of the new infrastructure (e.g. bridges, weirs), as well as the dams themselves will be constructed in or within 32 m of a watercourse, and some of that infrastructure will be located within identified Critical biodiversity areas.

as described in the final Environmental Impact Assessment (EIAr) dated February 2015 at:

Dam Wall

Dam sites (Location)	Latitude (S)	Longitude (E)
Ntabelanga Dam Wall– Left flank	31° 7'1.1"	28° 40'14.3"
Middle flank	31° 7'2.5"	28° 40'8.8"
Right flank	31° 7'5.7"	28° 40'29.9"
Lalini Dam Construction Centroid	31° 15' 54.1	28° 55'30.9"
Lalini Dam Wall – Middle	31° 15'45"	28° 55'17.2"
Dam wall start	31° 15'43"	28° 55' 23.8"
Dam wall end	31° 15'17.4"	28° 55 '9.9"
Dam wall centroid	31° 7'1.1"	28° 40'14.3"

Gauging Weirs

Location	Latitude(S)	Longitude (E)
New Gauging station 1 (u/s of Ntabelanga)	31° 4' 51.9"	28° 30' 53.9"
New Gauging station 2 (downstream of Ntabelanga)	31° 7' 8.4"	28° 41' 4.7"
New Gauging Station 3 (captures Inxu inflows)	31° 12' 8.7"	28° 43' 3.8"
New Gauging station 4 –(downstream of Lalini)	31° 16' 15.2"	28° 56' 22.3"
New Gauging station – downstream of hydropower return flow	31° 17'43.4"	29° 0' 29.4"

Waste Water Treatment Works

Alternative	Latitude	Longitude
Ntabelanga Dam	31° 7' 17.8"	28° 41' 21.5"
Ntabelanga Dam Main Water Treatment Works (Centre)	31° 7' 15.1"	28° 41' 7.6"
Lalini Dam	31° 16' 30.9"	28° 56' 34.7"

Alternative	Latitude	Longitude
Lalini Tunnel Option 3 – Start	31° 16'11.6"	28° 55'33.6"
Lalini Tunnel Option 3 – Middle	31° 17'4.6"	28° 57' 31.1"
Lalini Tunnel Option 3 – End	31° 17'50.8"	28° 59'15.4"
Lalini Tunnel Portal and Main HEP Construction Area Corner 1	31° 17'57.2"	28° 59'4.6"

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Lalini Tunnel Portal and Main HEP Construction Area Corner 2	31° 17' 45.1"	28° 59'7.8"
Lalini Tunnel Portal and Main HEP Construction Area Corner 3	31° 17' 46.3"	28° 59'19.5"
Lalini Tunnel Portal and Main HEP Construction Area Corner 4	31° 17' 57.5"	28° 59'17.1"
Irrigation Booster 2 Pump station (0.5 MW)	31° 19'38.9"	28° 44'2.1"
Irrigation Booster 2 Pump station (0.3 MW)	31° 17'38.7"	28° 40' 35.4"
Ntabelanga HEP supply pipeline - Start	31° 7' 1.1"	28° 40' 25.1"
Ntabelanga HEP supply pipeline - Mid	31° 7' 24.2	28° 40' 52.2"
Ntabelanga HEP supply pipeline - End	31° 7' 1.6"	28° 40' 25.1"
Ntabelnga plant discharge point	31° 7' 1.1"	28° 40'25.8"
Ntabelanga Dam Housing	31° 7'24.2"	28° 40'52.2"
Ntabelanga Dam pumping station 1 and 3	31° 7' 14.2"	28° 40' 26.9"

- for construction of the Mzimvubu Water Project: - Ntabelanga - Lalini Conjunctive Scheme and associated infrastructure, within the Alfred Nzo, Elundini, Mhlonto, Nyandeni, Ntabankulu, and Umzimvubu Local Municipalities, in the Eastern Cape Province, hereafter referred to as "the property".

The infrastructure associated with this facility includes:

- A dam a Ntabelanga site with a storage capacity of 490 million m^3;
- A dam at Lalini site with a storage capacity of approximately 150 million m^3;
- A pipeline and tunnel / conduit and a power house at Lalini Dam site for generating hydropower;
- Primary and secondary bulk potable water infrastructure:
  - Primary infrastructure: main water treatment works, including four major treated water pumping stations and three minor treated water pumping stations, main bulk treated water rising mains, and eight Command Reservoirs that will supply the whole region;
  - Secondary distribution lines: conveying bulk treated water from Command Reservoirs to existing and new District Reservoirs;
- Bulk water conveyance infrastructure (abstraction, pipelines, one raw water pumping station, one reservoir and two booster pumping stations) for irrigation agriculture (raw water supply up to field edge)
- Five new gauging stations;

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- Waste water treatment works at the dam sites;
- Accommodation for operations staff at the dam site;
- An information centre at each dam site;
- Miscellaneous construction camps;
- Quarries and borrow pits;
- Construction camp, laydown areas and storage sites

Conditions of this Environmental Authorisation

Scope of authorisation

1. The preferred Alternative 2 for the construction of Lalini Dam and Ntabelanga dam using a mass gravity Roller Compacted Concrete (RCC) dam, with integrated outlets and spillways, Alternative 3 for the Tunnel (3.2km), five (05) new gauging weirs, Waste Treatment Water Works, Ntabelanga Pump Stations 1 and 3, Ntabelanga HEP supply pipeline, Ntabelanga Dam Main Water Treatment Works, irrigation booster pump stations and other associated infrastructure as per the above mention geographic coordinates and the coordinates stated in Annexure 2 of this environmental authorisation are approved.
2. Authorisation of the activity is subject to the conditions contained in this environmental authorisation, which form part of the environmental authorisation and are binding on the holder of the authorisation.
3. The holder of the authorisation is responsible for ensuring compliance with the conditions contained in this environmental authorisation. This includes any person acting on the holder's behalf, including but not limited to, an agent, servant, contractor, sub-contractor, employee, consultant or person rendering a service to the holder of the authorisation.
4. The activities authorised may only be carried out at the property as described above.
5. Any changes to, or deviations from, the project description set out in this environmental authorisation must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes

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or deviations and it may be necessary for the holder of the authorisation to apply for further environmental authorisation in terms of the regulations.

6. This activity must commence within a period of five (5) years from the date of issue of this environmental authorisation. If commencement of the activity does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the activity to be undertaken.
7. Commencement with one activity listed in terms of this environmental authorisation constitutes commencement of all authorised activities.
8. The holder of an environmental authorisation must apply for an amendment of the environmental authorisation with the competent authority for any alienation, transfer or change of ownership rights in the property on which the activity is to take place.
9. In terms of section 43(7), an appeal under section 43 of the National Environmental Management Act, 1998 will suspend the environmental authorisation or any provision or condition attached thereto. In the instance where an appeal is lodged you may not commence with the activity until such time that the appeal has been finalised.

Notification of authorisation and right to appeal

10. The holder of the authorisation must notify every registered interested and affected party, in writing and within 12 (twelve) calendar days of the date of this environmental authorisation, of the decision to authorise the activity.
11. The notification referred to must –

11.1. specify the date on which the authorisation was issued;

11.2. inform the interested and affected party of the appeal procedure provided for in Chapter 7 of the Environmental Impact Assessment Regulations, 2010;

11.3. advise the interested and affected party that a copy of the authorisation will be furnished on request; and

11.4. give the reasons of the competent authority for the decision.

12. The holder of the authorisation must publish a notice –

12.1. informing interested and affected parties of the decision;

12.2. informing interested and affected parties where the decision can be accessed; and

12.3. drawing the attention of interested and affected parties to the fact that an appeal may be lodged against this decision in the newspaper(s) contemplated and used in terms of regulation 54(2)(c)

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and (d) and which newspaper was used for the placing of advertisements as part of the public participation process.

Management of the activity

13. The Environmental Management Programme (EMPr) submitted as part of the application for EA must be amended and submitted to the Department for written approval prior to commencement of the activity. The recommendations and mitigation measures recorded in the EIAr dated February 2015 must be incorporated as part of the EMPr. Once approved, the EMPr must be implemented and adhered to.
14. The amended EMPr must include a Relocation Policy Framework which must also include, but is not limited to, the following requirements:
    - 14.1 Thorough identification of abandoned homesteads and recording of field ownership is required.
    - 14.2 The locations of ancestral graves at abandoned homesteads affected by the project must be ascertained.
    - 14.3 Certain structures will require replacement so that the relevant family's socio-economic activities can continue.
    - 14.4 All graves within the full supply levels of the dams should be relocated, with the permission of the next-of-kin and a permit from the Eastern Cape Provincial Heritage Resources Agency (ECPHRA).
    - 14.5 No associated infrastructure may be located within 100 m of graves outside the full supply levels, and if unavoidable, these graves must also be relocated.
    - 14.6 A destruction permit is required from ECPHRA; if possible a single permit should be obtained for all affected structures.
    - 14.7 Avoid involuntary resettlement wherever possible.
    - 14.8 Undertake consultations with displaced people about acceptable alternatives and strategies and include them in the planning, implementation and monitoring processes.
    - 14.9 Choose the relocation site to ensure that the minimum disruption to displaced families and host communities occurs.
    - 14.10 Sensitise host communities to the pending arrival of the displaced communities and establish a forum or resettlement committee through which resettlement and integration can be controlled by those affected.

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14.11 A formal accessible grievance procedure must be implemented and communicated to both the displaced and host communities.

14.12 Ensure that the receiving environment is prepared and has adequate infrastructure, facilities and social services to support both the displaced and host communities, prior to moving the displaced communities.

Monitoring

15. The holder of the authorisation must appoint an experienced independent Environmental Control Officer (ECO) who will, on the behalf of the Environmental Monitoring Committee (EMC) (on weekly basis), monitor compliance with the conditions of the environmental authorisation, environmental legislation and the requirements of the approved EMPr.

15.1. The ECO must be appointed before commencement of any construction/ authorised activities.

15.2. Once appointed, the name and contact details of the ECO must be submitted to the *Director: Compliance Monitoring* of the Department.

15.3. The ECO must keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.

15.4. The ECO must remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and implemented to the satisfaction of the land owner and the EMC and the site is ready for operation.

15.5. The holder of the authorisation and Implementing Agency must ensure that an Environmental Monitor is on site on a daily bases, this individual will report to the ECO and ensure that the following are available and maintained on site

15.5.1 A daily site diary.

15.5.2 A non-conformance register

15.5.3 Public complaints register.

15.5.4 A register of Audits.

15.5.5 Copies of method statements.

15.5.6 Material Safety Data Sheets (MSDS) of all hazardous material stores.

15.5.7 Monitoring reports of the contractor/s.

15.5.8 Compliance and audit reports.

15.5.9 Training register.

15.5.10 Copy of the EA (and amendments to) and EMPr.

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15.5.11 Waste disposal certificates.

15.5.12 Copies of all certificates/approvals required during the construction phase.

15.6. The ECO must conduct monthly site visits to ensure compliance with the conditions of the EA is maintained onsite.

15.7. The ECO must report to the EMC (via monthly reports). The EMC must report on the performance of the ECO to the Department, Directorate: Compliance Monitoring and Enforcement every 03 (three) months and copy the holder of the authorisation.

15.8. The ECO must also submit quarterly (every 03 months) reports to the EMC and the Department.

15.9. Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

Recording and reporting to the Department

16. All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this environmental authorisation, must be submitted to the *Director: Compliance Monitoring* of the Department.
17. The holder of the authorisation must submit an environmental audit report to the Department within 30 days of completion of the construction phase (i.e. within 30 days of site handover) and within 30 days of completion of rehabilitation activities.
18. The environmental audit report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions as well as the requirements of the approved EMPr.
19. Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

Commencement of the activity

20. The authorised activity must not commence within twenty (20) days of the date of signature of the environmental authorisation.

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Notification to authorities

21. A written notification of commencement must be given to the Department no later than fourteen (14) days prior to the commencement of the activity. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence, as well as a reference number. This notification period may coincide with the notice of intent to appeal period.

Operation of the activity

22. A written notification of operation must be given to the Department no later than fourteen (14) days prior to the commencement of the activity operational phase.

Site closure and decommissioning

23. Should the activity ever cease or become redundant, the holder of the authorisation must undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.

Specific conditions

24. The Developer must generally not de-bush the dam basin except for a 300 m stretch upstream of the entire dam wall (in order to prevent blocking of the outlet works and safety boom).
25. **Lalini and Ntabelanga Dams and Associated Infrastructure**
    25.1. Ground-truthing must be conducted by the relevant specialists (amphibian, reptile, botanical, avian and aquatic) prior to commencement of construction activities for the whole servitude route.
    25.2. A qualified and experienced specialist must be appointed to undertake Search, Rescue and Relocation activities for indigenous vegetation (i.e. young seedlings, Aloe Species, Euphorbia species, and Cussonia species); especially around sensitive areas such as mountain / rocky ridges habitat, before commencement of construction activities (this includes site preparation and removal of vegetation). Search, rescue and Relocation activities must take place during the appropriate seasons.

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25.3. All roads and bridges to be inundated must be compensated by provision of new roads and bridges.

25.4. Permits must be obtained for the removal of Podocarpus species, should they be found within the construction footprint. All permits must be in place before commencement of construction activities

25.5. Disturbance to the Mountain Rocky Outcrop and protected floral species must be avoided during construction activities. Permits must be obtained for removal or destruction of any protected tree species prior to commencement of construction activities.

25.6. A qualified specialist must be appointed to investigate the impact the authorised development will have on the waterfall dependent plants in the gorge and on the cliff. The specialist must make recommendations on whether or not these plant species will require relocation; the findings of the specialist must be incorporated into the amended EMPr.

25.7. Temporary access roads must be located within areas of low sensitivity or areas that will be inundated after completion of construction activities.

25.8. As per the above conditions, related to construction activities for the Lalini Dam, there must also be floral search, rescue and relocation activities for Lalini and Ntabelanga Dam before commencement of construction activities;

25.9. The specialist must do a final walkdown of the final servitude for the pipeline to ensure that all sensitive features are taken into consideration during finalisation of the pipeline route.

25.10. A holding nursery must be established for the storage of indigenous vegetation suitable for transplanting as part of site rehabilitation activities once construction activities have ceased in the affected areas.

25.11. There must be rehabilitation using indigenous grass species of all areas beyond the development footprint that were negatively impacted by construction activities.

25.12. Vegetation clearance must be limited to the development footprint.

25.13. Should any Red Data Listed (RDL) faunal species or species of conservation concern be found during the search and rescue operations, these species must be relocated to similar habitat within the vicinity of the study area, which habitat will not be impacted by development activities.

25.14. All stockpiles must be well managed and have measures such as berms and hessian sheets implemented to prevent erosion and sedimentation.

25.15. Baseflows must be maintained during the construction phase and the duration of the impact on flows must be limited as much as possible.

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26. Two weeks' notice must be given to landowners, Management Authority (of the proposed Mhlontlo Nature Reserve) and ratepayers associations before commencement of construction activities.
27. On-going biomonitoring must take place 1 year prior to construction (on a quarterly basis) and throughout the construction and operation (on a minimum of 6 monthly basis in the spring and autumn of each year) to determine trends in ecology and define any impacts requiring mitigation.
28. Baseline studies must be undertaken on noise, air quality and water quality. These studies must form part of the amended final EMPr to be submitted to this department for approval.
29. Stormwater control measures must provide for erosion and sedimentation control, and for the reinforcement of banks and drainage features, where required.
30. Environmental Water Requirement (EWR) releases as specified in the reserve determination must be implemented.
31. A study must be undertaken for the necessity and design specifications for an eel-way and the findings must be implemented and included in the amended EMPr.
32. An alien vegetation control programme must be implemented at the construction sites. A method statement for erosion management and sediment control must be developed, including the possible use of gabions, or reno mattresses, re-vegetation of profiled slopes, erosion berms, drift fences with hessian and silt traps, from the outset of construction activities.
33. Measures to minimize impact and pollution on the water quality of the nearby rivers (solid waste, oil spills, discharge of sewage) must be implemented.
34. Support structures for pipelines must be placed outside of riparian features, channelled valley bottom wetlands and drainage lines. Should it be essential to place such support structures within these features, the designs of such structures must ensure that the creation of turbulent flow in the system is minimised, in order to prevent downstream erosion. No support pillars should be constructed within the active channels and infrastructure should cross wetlands at right angles.
35. All graves within the full supply levels of the dams must be relocated, with the permission of the next-of-kin and a permit from ECPHRA.
36. No associated infrastructure may be located within 100 m of graves outside the Full supply levels, and if unavoidable, these graves must be relocated.
37. All graves outside the full supply level within 300 m of associated infrastructure should be demarcated by the Environmental Control Officer, in consultation with the next-of-kin, for the duration of construction with metal stanchions, fencing wire and red and white barrier tape. A Grave Relocation plan must be included in the amended EMPr.
38. The archaeological site identified in the approved Ntabelanga Dam basin must be mapped in detail, with judicious sampling, authorised by a permit from ECPHRA.

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39. Thereafter the site may be destroyed once a destruction permit has been issued by ECPHRA.
40. The archaeological site identified in the approved Lalini Dam basin must be mapped and excavated/sampled, as authorised by a permit from ECPHRA. Thereafter the site may be destroyed once a destruction permit has been issued by ECPHRA.
41. A detailed survey of potential Early Iron Age sites must be undertaken once crops have been harvested and vegetation clearance has occurred.
42. Should any heritage artefacts or graves be exposed during excavation, work on the area where the artefacts or remains were discovered shall cease immediately.
43. All discoveries must be reported immediately to an archaeologist so that an investigation and evaluation of the finds can be made. Necessary actions must be taken based on the advice from the archaeological specialist.
44. Top soil is stockpiled in piles not exceeding 1.5m in height.
45. No activities will be allowed to encroach into a water resource without a water use authorisation being in place from the Department of Water and Sanitation.
46. The holder of the authorisation must obtain a wayleave from the Department of Public Transport Roads and Works prior to construction.
47. The haul road linking the sand borrow areas furthest from the dam wall to the Lalini Dam construction site must be realigned to avoid going through the town of Lalini.
48. The crossing designs of bridges must ensure that the creation of turbulent flow in the system is minimised, in order to prevent downstream erosion. All crossings on wetlands must take place at right angles wherever possible.
49. The design of culverts and bridges must allow for wetland soil conditions to be maintained both upstream and downstream of the crossing to such a degree that wetland community structures upstream and downstream of the crossings are maintained.
50. No incisions and canalisations of the wetland systems must take place as a result of the construction of culverts.
51. Flow connectivity along the wetland features must be maintained.
52. The Ecological Water Requirements (EWR) as set out in the Reserve Determination Volume 1: River (Report P WMA 12/T30/00/5212/7) for the iNtabelanga Dam and the EWR determination for the Lalini Dam must be adhered to.
53. Multiple level outlets must be installed, with outlets at no more than 6.5 m intervals from 7 m below the full supply level of the dams. There must also be proper operation to mitigate the effect of water quality changes downstream of the authorised dams.

54. A botanist must be appointed to perform a final walkthrough of the alignment to identify sensitive plant species, and assist in identifying the areas that require protection.
55. A permit must be obtained from the relevant nature conservation agency for the removal or destruction of indigenous protected or endangered plant or animal species.
56. Copies of all permits required for the authorised development must be submitted to the Department for record keeping.
57. No exotic plants may be used for rehabilitation purposes. Only indigenous plants of the area may be utilised.
58. Liaison with land owners/farm managers is to be done prior to construction in order to provide sufficient time for them to plan agricultural activities. If possible, construction should be scheduled to take place within the post-harvest, pre planting season, when fields are lying fallow.
59. The holder of the authorisation is required to inform the Department of Agriculture Forestry and Fisheries and this Department should the removal of protected species, medicinal plants and "data deficient" plant species be required.
60. Vegetation clearing must be kept to an absolute minimum. Mitigation measures must be implemented to reduce the risk of erosion and the invasion of alien species.
61. Construction must include design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.
62. An integrated waste management approach must be implemented that is based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste must be disposed of at a landfill licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act No.59 of 2008).

Environmental Monitoring Committee

63. An environmental Monitoring Committee (EMC) must be established by the holder of the authorisation before commencement of construction activities.

63.1. The EMC must meet before the commencement of construction activities (to appoint a chairperson discuss terms of reference), from then on the EMC must sit once every two months, special meetings can be convened on special situations as determined by the ECO and the EMC chairperson in consultation with the Department.

The EMC must comprise of the following representatives:

- Chairperson;

- National Environmental Department (Observer);
- The holder of the authorisation;
- Provincial Environmental Department;
- Mhlonto Nature Reserve Management
- Provincial Conservation Authority;
- Provincial Roads Department;
- Representative from Gowrie Village and other affected residents/associations;
- Crain foundation and Nature Reserve;
- Non-Governmental Organisations;
- Local Government; and
- The Environmental Control Officer.

Management agreement with the proposed Mhlonto Nature Reserve

64. No new permanent roads, structures or infrastructure may occur above the full supply level in the areas that falls within the proposed Mhlonto Nature Reserve (excluding a portion of the authorised Lalini dam wall).
65. All construction personnel must attend environmental awareness training (a representative from the Mhlontlo Nature Reserve must be present at this training) before commencement of any construction activities inside the reserve.

Offsets

66. The holder of the authorisation must contribute funds to existing conservation projects in the area i.e. existing projects that protect crane or their foraging and breeding areas elsewhere in the Eastern Cape Province.

General

67. A copy of this environmental authorisation and the approved EMPr must be kept at the property where the activity will be undertaken. The environmental authorisation and approved EMPr must be

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produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who undertakes work at the property.

68. National government, provincial government, local authorities or committees appointed in terms of the conditions of this environmental authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the holder of the authorisation or his/her successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the holder of the authorisation with the conditions of authorisation as set out in this document or any other subsequent document emanating from these conditions of authorisation.

Date of environmental authorisation: 17/06/2015

Mr Sabelo Malaza
Chief Director: Integrated Environmental Authorisations
Department of Environmental Affairs

Annexure 1: Reasons for Decision

1. Information considered in making the decision

In reaching its decision, the Department took, *inter alia,* the following into consideration -

a) The information contained in the final EIAr dated February 2015;
b) The comments received from the Department of Water and Sanitation, Eastern Cape COGTA: Spatial Planning Directorate, NEPSA Energy, University of Fort Hare, Eastern Cape Economic Development, Environmental Affairs and Tourism and interested and affected parties as included in the EIAr dated February 2015 and Appendix B dated April 2015;
c) Mitigation measures as proposed in the final EIAr dated February 2015 and the EMPr;
d) The information contained in the specialist studies contained within the final EIAr dated February 2015;
e) Findings of the site visit conducted on 12 March 2014 and
f) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act No.107 of 1998).

2. Key factors considered in making the decision

All information presented to the Department was taken into account in the Department's consideration of the application. A summary of the issues which, in the Department's view, were of the most significance is set out below.

a) The findings of all the specialist studies conducted and their recommended mitigation measures.
b) The need for this project stems from the fact that the Mzimvubu River catchment in the Eastern Cape of South Africa is within one of the poorest and least developed regions of the country. Development of the area to accelerate the social and economic upliftment of the people was therefore identified as one of the priority initiatives of the Eastern Cape Provincial Government.
c) The final EIAr dated February 2015 identified all legislation and guidelines that have been considered in the preparation of the final EIAr dated February 2015.

d) The methodology used in assessing the potential impacts identified in the final EIAr dated February 2015 and the specialist studies has been adequately indicated.

e) A sufficient public participation process was undertaken and the applicant has satisfied the minimum requirements as prescribed in the EIA Regulations, 2010 for public involvement.

3. Findings

After consideration of the information and factors listed above, the Department made the following findings -

a) The identification and assessment of impacts is detailed in the final EIAr dated February 2015 and sufficient assessment of the key identified issues and impacts has been completed.

b) The procedure followed for impact assessment is adequate for the decision-making process.

c) The proposed mitigation of impacts identified and assessed adequately curtails the identified impacts.

d) The information contained in the final EIAr dated February 2015 is accurate and credible.

e) EMPr measures for the pre-construction, construction and rehabilitation phases of the development were proposed and included in the final EIAr and will be implemented to manage the identified environmental impacts during the construction process.

In view of the above, the Department is satisfied that, subject to compliance with the conditions contained in the environmental authorisation, the authorised activities will not conflict with the general objectives of integrated environmental management laid down in Chapter 5 of the National Environmental Management Act, 1998 and that any potentially detrimental environmental impacts resulting from the authorised activities can be mitigated to acceptable levels. The environmental authorisation is accordingly granted.

Annexure 2: Coordinates for Bulk Irrigation and Bulk Water Reticulation

		Latitude (S)			Longitude (E)		
Ref	Description	Deg	Min	Sec	Deg	Min	Sec
52	Secondary pipe - Zone 2 - Culunca Res to Res D Start	31°	1'	21.8"	28°	42'	39.8"
53	Culunca Res Centroid	31°	1'	21.8"	28°	42'	39.8"
54	Secondary pipe - Zone 2 - Culunca Res to Res D Mid	30°	58'	4.3"	28°	46'	38.4"
55	Secondary pipe - Zone 2 - Culunca Res to Res D End	30°	52'	59.6"	28°	42'	58.5"
56	Secondary Res D Centroid	30°	52'	59.6"	28°	42'	58.5"
57	Secondary pipe - Zone 3 - tee Sidwadweni West Start	31°	23'	36.3"	28°	43'	46.9"
58	Secondary pipe - Zone 3 - tee Sidwadweni West Mid	31°	24'	7"	28°	43'	48.9"
59	Secondary pipe - Zone 3 - tee Sidwadweni West End	31°	24'	32.6"	28°	43'	39"
60	Secondary Sidwadweni West Resevoir Centroid	31°	24'	32.6"	28°	43'	39"
61	Secondary pipe - Zone 3 - tee Tsolo Res Start	31°	18'	46.9"	28°	45'	21.7"
62	Secondary pipe - Zone 3 - tee Tsolo Res Mid	31°	18'	45"	28°	45'	8.2"
63	Secondary pipe - Zone 3 - tee Tsolo Res End	31°	18'	55.2"	28°	45'	2.3"
64	Secondary Tsolo Res Centroid	31°	18'	55.2"	28°	45'	2.3"
65	Secondary pipe - Zone 2 - tee to Res A Start	31°	0'	13.7"	28°	55'	19.8"
66	Secondary pipe - Zone 2 - tee to Res A Mid	31°	0'	15.3"	28°	55'	22.4"
67	Secondary pipe - Zone 2 - tee to Res A End	31°	0'	16.9"	28°	55'	25.1"
68	Secondary Res A Centroid	31°	0'	16.9"	28°	55'	25.1"
69	Secondary pipe - Zone 2 - tee to Res C Start	31°	1'	55.3"	28°	44'	51.1"
70	Secondary pipe - Zone 2 - tee to Res C Mid	31°	0'	33.5"	28°	52'	27.1"
71	Secondary pipe - Zone 2 - tee to Res C End	30°	56'	56.3"	28°	58'	33.3"
72	Secondary Res C Centroid	30°	56'	56.3"	28°	58'	33.3"
73	Secondary pipe - Zone 2 - tee to command reservoir Start	31°	9'	33.8"	28°	57'	14"
74	Secondary pipe - Zone 2 - tee to command reservoir Mid	31°	6'	45.3"	28°	52'	17.2"
75	Secondary pipe - Zone 2 - tee to command reservoir End	31°	2'	21.8"	28°	47'	44.3"
76	Secondary Command reservoir Centroid	31°	2'	21.8"	28°	47'	44.3"
77	Secondary pipe - Zone 2 - tee to Res B Start	30°	58'	19.9"	28°	58'	27.9"
78	Secondary pipe - Zone 2 - tee to Res B Mid	30°	57'	58.6"	28°	58'	0.3"
79	Secondary pipe - Zone 2 - tee to Res B End	30°	57'	37.7"	28°	57'	32.8"
80	Secondary Res B Centroid	30°	57'	37.7"	28°	57'	32.8"
81	Secondary pipe - Zone 1 - Res 1 to Mvumlwano Res Start	31°	4'	48.3"	28°	41'	56.9"
82	Secondary pipe - Zone 1 - Res 1 to Mvumlwano Res Mid	31°	9'	7.3"	28°	47'	15.2"
83	Secondary pipe - Zone 1 - Res 1 to Mvumlwano Res End	31°	10'	56.5"	28°	53'	10.5"
84	Secondary Mvumlwano Res Centroid	31°	10'	56.5"	28°	53'	10.5"
85	Secondary pipe - Zone 3 - Res 3 to Nduku Res Start	31°	8'	22.9"	28°	37'	18.7"
86	Secondary pipe - Zone 3 - Res 3 to Nduku Res Mid	31°	9'	10.4"	28°	43'	33.6"
87	Secondary pipe - Zone 3 - Res 3 to Nduku Res End	31°	14'	45.3"	28°	44'	7.3"
88	Secondary Nduku Res Centroid	31°	14'	45.3"	28°	44'	7.3"
89	Secondary pipe - Zone 3 - Nduku to Sidwadweni East Start	31°	14'	45.3"	28°	44'	7.2"

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90	Secondary pipe - Zone 3 - Nduku to Sidwadweni East Mid	31°	21'	55.2"	28°	46'	11.7"
91	Secondary pipe - Zone 3 - Nduku to Sidwadweni East End	31°	25'	0.3"	28°	47'	40"
92	Secondary Sidwadweni East Res Centroid	31°	25'	0.3"	28°	47'	40"
93	Secondary pipe - Zone 3 - tee Tsolo Junction Res Start	31°	21'	34.6"	28°	46'	5.9"
94	Secondary pipe - Zone 3 - tee Tsolo Junction Res Mid	31°	21'	18.9"	28°	47'	6.4"
95	Secondary pipe - Zone 3 - tee Tsolo Junction Res End	31°	21'	2.6"	28°	48'	14.2"
96	Secondary Tsolo Junction Res Centroid	31°	21'	2.6"	28°	48'	14.2"
97	Bulk irrigation pipes - WTW to storage dam Start	31°	13'	30.2"	28°	43'	34.4"
98	Bulk irrigation pipes - WTW to storage dam Mid	31°	10'	38"	28°	40'	24.1"
99	Bulk irrigation pipes - WTW to storage dam End	31°	7'	14.8"	28°	41'	9.6"
100	Bulk irrigation pipes - Storage dam to reticulation Start	31°	13'	30.9"	28°	43'	35.6"
101	Bulk irrigation pipes - Storage dam to reticulation Mid	31°	14'	40.9"	28°	41'	52.5"
102	Bulk irrigation pipes - Storage dam to reticulation End	31°	16'	50"	28°	41'	60"
103	Bulk Irrigation Junction 1 - Start	31°	15'	20.7"	28°	42'	20.6"
104	Irrigation to Farm Unit Branch 1.1 End	31°	15'	26"	28°	42'	41.5"
105	Irrigation to Farm Unit Branch 1.2 End	31°	15'	42.6"	28°	41'	23.3"
106	Bulk Irrigation Junction 2 - Start	31°	15'	41.3"	28°	42'	26.8"
107	Irrigation to Farm Unit Branch 2.1 End	31°	15'	45.3"	28°	42'	10.9"
108	Bulk Irrigation Junction 3 - Waypoint	31°	16'	19.2"	28°	42'	46.6"
109	Bulk Irrigation Junction 4 - Start	31°	15'	58.7"	28°	43'	14.1"
110	Irrigation to Farm Unit Branch 4.1 End	31°	15'	46.3"	28°	42'	57.5"
111	Irrigation to Farm Unit Branch 4.2 End	31°	16'	39.4"	28°	43'	34.9"
112	Bulk Irrigation Junction 5 - Start	31°	16'	28"	28°	42'	23.5"
113	Irrigation to Farm Unit Branch 5.1 End	31°	16'	19.4"	28°	42'	1.1"
114	Bulk Irrigation Junction 6 - Waypoint	31°	16'	50.4"	28°	41'	59.8"
115	Bulk Irrigation Junction 7 - Start	31°	16'	58.5"	28°	40'	47.4"
116	Irrigation to Farm Unit Branch 7.1 End	31°	16'	46"	28°	40'	35.2"
117	Bulk Irrigation Junction 8 - Start	31°	17'	13.2"	28°	40'	48.6"
118	Irrigation to Farm Unit Branch 8.1 End	31°	17'	13.5"	28°	40'	53.7"
119	Bulk Infrastructure Junction 9 - Waypoint	31°	17'	38.9"	28°	40'	19.4"
120	Bulk Irrigation Junction 10 - Start	31°	17'	49"	28°	40'	22.3"
121	Irrigation to Farm Unit Branch 10.1 End	31°	17'	49.6"	28°	40'	26.7"
122	Bulk Irrigation Junction 11 - Waypoint	31°	18'	46.6"	28°	39'	57.8"
123	Bulk Irrigation Junction 12 - Start	31°	17'	38.4"	28°	39'	50.9"
124	Irrigation to Farm Unit Branch 12.1 End	31°	17'	46"	28°	39'	47.3"
125	Bulk Irrigation Junction 13 - Start	31°	17'	22.7"	28°	39'	45.8"
126	Irrigation to Farm Unit Branch 13.1 End	31°	17'	18"	28°	39'	51.8"
127	Bulk Irrigation Junction 14 - Start	31°	17'	21.8"	28°	39'	20.1"
128	Irrigation to Farm Unit Branch 14.1 End	31°	16'	51.2"	28°	39'	23"
129	Bulk Irrigation Junction 15 - Start	31°	17'	16.4"	28°	39'	6.6"
130	Irrigation to Farm Unit Branch 15.1 End	31°	16'	45.8"	28°	38'	49"
131	Bulk Irrigation JUnction 16 - Start	31°	16'	58.9"	28°	38'	19.4"
132	Irrigation to Farm Unit Branch 16.1 End	31°	16'	56"	28°	38'	27.3"
133	Bulk Irrigation Junction 17 - Start	31°	16'	56.6"	28°	38'	11.8"

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134	Irrigation to Farm Unit Branch 17 - Waypoint	31°	17'	23.7"	28°	37'	0.9"
135	Bulk Irrigation Junction 18 - Start	31°	16'	21.5"	28°	37'	3.8"
136	Irrigation to Farm Unit Branch 18.1 End	31°	16'	15.6"	28°	37'	13.6"
137	Irrigation to Farm Unit Branch 18.2 End	31°	16'	33"	28°	36'	32.4"
138	Bulk Irrigation Junction 19 - Waypoint	31°	17'	3.9"	28°	42'	28.4"
139	Bulk Irrigation Junction 20 - Start	31°	17'	41.4"	28°	41'	58.3"
140	Irrigation to Farm Unit Branch 20.1 End	31°	17'	44.7"	28°	41'	43.7"
141	Bulk Irrigation Junction 21 - Waypoint	31°	17'	57.6"	28°	42'	4.3"
142	Bulk Irrigation Junction 22 - Start	31°	17'	16.7"	28°	42'	53.8"
143	Irrigation to Farm Unit Branch 22.1 End	31°	17'	33.4"	28°	42'	37.4"
144	Bulk Irrigation JUnction 23	31°	17'	21"	28°	43'	2.7"
145	Bulk Irrigation Junction 24 - Start	31°	18'	8.5"	28°	42'	59.6"
146	Irrigation to Farm Unit Branch 24.1 End	31°	18'	29.4"	28°	42'	26.7"
147	Irrigation to Farm Unit Branch 24.2 End	31°	18'	21.7"	28°	42'	55.3"
148	Bulk Irrigation Junction 25 - Start	31°	17'	39.7"	28°	44'	14.2"
149	Irrigation to Farm Unit Branch 25.1 End	31°	17'	31.3"	28°	44'	53.1"
150	Bulk Irrigation Janction 26 - Start	31°	18'	25.2"	28°	43'	47.4"
151	Irrigation to Farm Unit Branch 26.1 End	31°	18'	19.1"	28°	43'	47.9"
152	Bulk Irrigation Junction 27 - Start	31°	18'	59.3"	28°	43'	25.1"
153	Irrigation to Farm Unit Branch 27.1 End	31°	19'	3.2"	28°	43'	15.1"
154	Bulk Irrigation Junction 28	31°	19'	7.3"	28°	43'	29.9"
155	Bulk Irrigation Junction 29 - Start	31°	19'	23.8"	28°	42'	50.6"
156	Irrigation to Farm Unit Branch 29.1 End	31°	19'	35.2"	28°	42'	46.2"
157	Irrigation to Farm Unit Branch 29.2 End	31°	19'	51.3"	28°	42'	1"
158	Bulk Irrigation Junction 30 - Waypoint	31°	19'	42.5"	28°	44'	1.5"
159	Bulk Irrigation Junction 31 - Waypoint	31°	19'	30.9"	28°	44'	49.8"
160	Bulk Irrigation Junction 32 - Start	31°	19'	48"	28°	43'	49"
161	Irrigation to Farm Unit Branch 32.1 End	31°	19'	30"	28°	43'	31.1"
162	Bulk Irrigation Junction 33 - Start	31°	20'	4.2"	28°	43'	32.3"
163	Irrigation to Farm Unit Branch 33.1 End	31°	19'	58.4"	28°	43'	18.7"
164	Bulk Irrigation Junction 34 - Start	31°	20'	18.7"	28°	43'	36.5"
165	Irrigation to Farm Unit Branch 34.1 End	31°	20'	31"	28°	43'	27.9"
166	Bulk Irrigation Junction 35 - Waypoint	31°	20'	22.9"	28°	44'	17.6"
167	Irrigation to Farm Unit Branch 35.1 End	31°	20'	13.8"	28°	44'	17.1"
168	Bulk Irrigation Junction 36 - Start	31°	20'	35.5"	28°	44'	26.8"
169	Irrigation to Farm Unit Branch 36.1 End	31°	20'	45.5"	28°	44'	18.5"
170	Irrigation to Farm Unit Branch 36.2 End	31°	20'	51.1"	28°	45'	2.2"
171	Irrigation to Farm Unit Branch 36.3 End	31°	21'	12.9"	28°	44'	16.6"
33	Primary pipe - WTW to Res 1 Start	31°	7'	14"	28°	41'	9.1"
34	Primary pipe - WTW to Res 1 Mid	31°	6'	22.3"	28°	42'	8.7"
35	Primary pipe - WTW to Res 1 End	31°	5'	12.8"	28°	42'	0.2"
36	Primary Res 1 Centroid	31°	5'	12.8"	28°	42'	0.2"
37	Primary pipe - WTW to Res 3 Start	31°	7'	14.8"	28°	41'	9.7"
38	Primary pipe - WTW to Res 3 Mid	31°	9'	27"	28°	40'	12.8"

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39	Primary pipe - WTW to Res 3 End	31°	8'	27.3"	28°	37'	29.8"
40	Primary Res 3 Centroid	31°	8'	27.3"	28°	37'	29.8"
41	Primary pipe - Res 3 to Res 4 Start	31°	8'	27.3"	28°	37'	29.8"
42	Primary pipe - Res 3 to Res 4 Mid	31°	9'	47.6"	28°	33'	51.1"
43	Primary pipe - Res 3 to Res 4 End	31°	9'	58"	28°	29'	46.8"
44	Primary Res 4 Centroid	31°	9'	58"	28°	29'	46.8"
45	Primary pipe - Res 1 to Res 2 Start	31°	5'	12.8"	28°	42'	0.2"
46	Primary pipe - Res 1 to Res 2 Mid	31°	3'	16.8"	28°	43'	25.9"
47	Primary pipe - Res 1 to Res 2 End	31°	1'	21.9"	28°	42'	39.5"
48	Primary Res 2 Centroid	31°	1'	21.9"	28°	42'	39.5"