

Nol-Turesh Loitokitok Water & Sanitation Company Limited

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NOLWASCO WATER PIPELINE STATUS REPORT OCTOBER 2020

The company serves various areas of the three counties (Machakos, Kajiado and Makueni). The project was commissioned in 1990. The total population served is about 258,819 with a total of 9,147 connections of which 5,680 are active and 3,467 are in active.

Existing Water Supply System

Source Works: The source works are situated at the Nol-Turesh Springs, and comprise of a spring water collection chamber, a two-storey source works control and dosing building and chemical storage room. The source works serve two separate piped water supply systems:

- ❖ The Nol-Turesh Pipeline
- ❖ Oloitokitok town Water Supply-This comprises of two pumping stations; at the source works and at the intermediate pumping station. All the two pumping stations have pump sets with a capacity of 50m³/hr, pumping head of 172m and power requirement of 45kw to run each of the pump set. The water is stored in a masonry storage tank (500m³) at Loitokitok town for distribution by gravity. There is also a masonry storage tank at the intermediate pumping station of 200m³ capacity for temporarily storing water before pumping to the Loitokitok tank.

The Nolturesh Pipeline and its Main Components: There is a 550mmØ 125.3Km long gravity main from the source works to the suction tank of Pump Station No.1 [PSI]. At PSI, the water is lifted to the Kiima Kiu Reservoir tank (3000m³ capacity) through a 9.8Km long 550mmØ pumping main.

There is also 200mm [8"] Ø 50Km long gravity branch main [at Km 76 of the pipeline], which serves Mashuru corridor and Mashuru town Centre.

There is also a gravity main 9.3Km long 550mmØ connecting Kiima Kiu to pressure divider No.1 [PDI]. The PDI function is to sub-divide delivery between the Kajiado Pipeline section and the gravity main leading to Pressure Divider No.2 [PD2]. Gravity main 39.7Km long, 250mm Ø runs from PDI to the suction tank of Pumping Station No.2 [PS2]. At PS2, water is lifted from the suction tank by a 250mm Ø, 3Km long pumping main to the Cairn Hill reservoir near Kajiado town.

A gravity main 10.5Km long, 400mm Ø connects PDI to Pressure Divider No.2 [PD2]. The PD2 divides the incoming flow into two branches, one feeding the Machakos Line and the other feeding the Lukenya Line. The Machakos Reservoir is connected to PD2 by a gravity main of 300mm Ø, 16.4Km long. While the Lukenya Reservoir is connected by a gravity main of 250mm Ø, 24Km long. The Lukenya Reservoir is then connected to the Athi River Reservoir by gravity main 250mm Ø and 11.2Km long.

Condition of Water Supply Systems

Intake Works: The intake works comprise of a weir and reinforced concrete structures that are in good condition. The level of the spring water does not fluctuate although the designed yield capacity was estimated as 120l/s.

Pump Station No.1 [PSI]: The station has facilities to accommodate 4No. Pumping units each, of capacity 180m³/hr and a pumping head of 372m. There is also a standby pumping unit of the same capacity. Currently, the station has two new pump sets which are working and in good condition.

Abstraction: Currently the water supply system is abstracting water as follows

- ❖ Nol-Turesh Corridor - 10,500 m³ per day
- ❖ Loitokitok Corridor - 1,200 m³ per day

The water demand is estimated to be about 18,000 m³ per day which is met through water rationing and adequate storage in the storage tanks. Much of this water is used in illegal irrigation.

Storage Tanks

The water supply has 9No. Storage tanks of the following capacities:

Tank type	Capacity	Unit	Location
1 No. reinforced concrete tank	13,600	m ³	Nzai
1 No. reinforced concrete tank	3,000	m ³	Kiima Kiu
1 No. reinforced concrete tank	500	m ³	PSI
1No. masonry tank	135	m ³	Mashuuru
1No. still elevated tank	50	m ³	Main office
1No. masonry tank	500	m ³	Loitokitok office
Masonry tank	200	m ³	Loitokitok Intermidiate
Masonry tank	225	m ³	Sultan hamud –Maasa ini
Masonry tank	250	m ³	Kasikeu

Distribution System: The distribution system is a gravity one and is in a fair condition apart from the interference and frequent bursts of the pipeline that occurs in the first 130 Km from the source works to Salama town, while the rest 180km is pumping mainly to the three WSPS namely, Machakos, Mavoko and Kajiado.

Emali scheme- Served from Nzai tank (13,600m³) and with a outlet pipe of 6", 10km pipe to the reticulation system of the town. There is a 13km extension of 4" pipeline from Emali town to Nguu/kikumini areas

Mulala scheme- Served from mainline with a 6" -18km pipeline to Mulala tank (50m³), and Matiku tank (100M³)

Lekishon scheme-served from mainline with a 4"- 4km pipeline

Meka Scheme-served from mainline with a 2"- 8km pipeline to kiiani tank

Kasikeu scheme-Served from Mainline with a 12km -6"pipeline to Kasikeu town, Kandolo and Mutyamboo areas

Kavuthu Scheme-served from mainline with a 6"-16 km pipeline to kavuthu ,vulueni and Mateso areas

Kimana Scheme- served from mainline with a 3"-5km pipeline to kimana town

Major Challenges Facing the Water Supply System

The constraints affecting the normal operation of the company include the following:

1. Massive illegal irrigation along the pipeline from source to Sultan Hamud and along the 50 km Mashuuru line, costing the company loss of revenue hence making it expensive to operate. This leads to high Un-accounted for Water (UfW) hence loss of revenue and leading to unnecessary rationing, *as they are also unmetered*
2. Interference of the water supply system along the entire pipeline as the consumers often break the water air valves and chambers to access water. This costs the company a lot of money to repair the pipe line.
3. The Supply System is old having been installed in the early 1990's. This leads to frequent breakdowns and repairs affecting the overall performance of the water supply
4. High cost of pumping at the source works for the Loitokitok town corridor and PS1 which is not sustainable.
5. Low water tariffs which have not been reviewed since the year 2009.
6. Vandalism of the metallic chamber covers by scrap metal dealers
7. Vandalism of the initial Cathodic protection of the steel pipeline, the solar components were stolen
8. Poor pipeline access road due to erosion, exposure of pipeline sections
9. 11 Free water points along the main line and mashuru line
10. Bad debts, most of the revenue is currently offsetting loans and other debts to a tune of about Kshs.200M

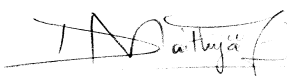
Ps1 Details and Status

- The generator is working okay. -2000kVA with cummings engine and Stamford alternator
- 4 batteries are in good condition and working perfectly.
- All generators parameters are okay.
- Ongoing installation module 7320 and trickle charger 24VDC to facilitate automatic changeover and battery charging respectively-supported by ASPAC/Mavoko/Tanathi project.
- Oil pressure switch, temperature switch and control relay need to be installed for generator protection and monitoring.
- 4 booster pumps are in good working condition, scope of works (2 new installed through KOTDA, 1 new through ASPAC and 1 through TANATHI which needs cable installation)
- Pump head 372 meters
- Pump discharge 180m³ /hr or 15litres/sec
- Motor old model 435 Amps, 275 kwatts, 3phase (control panel)
- Lighting system to be installed
- 500m³ tank in good condition, painting works needed
- Need of a guard house and Washroom facility
- Need of a new 630KVA transformer

Recommendations

- ❖ Replacement of the blown up transformer at PSI -630KVA
- ❖ KOTDA, Malili and Salama areas to focus on getting water from Nolturesh –fresh and clean water
- ❖ There is a debt of kshs 7.6M to Jose hansen for the water booster pumps balance which needs to be paid
- ❖ All the customers along the pipe line should be metered irrespective of the water usage. This will completely eliminate illegal irrigation and drastically reduce the UFW which really affects the Company's performance and also act as a way of controlling water use and improve water delivery to PS1 and other areas.
- ❖ Revive the corrosion protection mechanism by restoration of solar panels and cables to activate the process, Modernisation of the mechanism of cathodic protection
- ❖ Remote sensing at kiu tank, power lighting systems at PS1 and Kiu tanks
- ❖ Replacement of non-functional Air valves, Sluice valves, Butterflies and wash out vessels as per pressure requirements-PN40 and sizes (50mm-400mm)
- ❖ Improvement/grading of the access road and backfilling of exposed pipeline sections

Prepared by



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