

NORPALM OIL MILL



BACKGROUND HISTORY

- Norpalm Ghana Limited (NGL) factory was commissioned in 1969 as Asraku Oil Mill by State Farms Corporation.
- In the 1980's, GOG rehabilitated the mill and changed the name of the organization to National Oil Palm Limited (NOPL).
- In 1998 the former company NOPL was divested by GOG to Norpalm Ghana Limited (NGL)
- Full production started in September 2000 as a 20 ton per hour mill with dilapidated equipment that could only process FFB of 5 ton per hour.
- Since 2000 a lot of investments have been made in the mill including operational waste management.

Mill

- ❑ The mill processes an average of 110,000 mt of FFB to produce 19,000 mt of CPO and 1,800mt of PKO.
- ❑ The CPO plant has a capacity of 25 mt per hour and it is in the process of upgrading to 30 mt per hour.
- ❑ The PKO plant has a capacity of 6mt of PKO per day
- ❑ Other by-products generated are :
 - PKC - sold to 3rd party buyers and used as animal feed
 - PKS - used as fuel for power generation
 - EFB - sent to the plantation and used as mulch

The Extraction of Palm Oil

The extraction process is a series of separating processes. These are described below.

❖ Harvesting

Palm oil is extracted from oil palm trees grown in the tropics and originated in Africa.

❖ Fruit Reception

The arriving fruits, usually in trucks are dumped into FFB hopper. It is then transferred into fruit cages. The cages are then moved into sterilisers.

❖ Sterilisation

The steriliser is similar in function of a pressure cooker. The fruits are heated with steam at a pressure of 3 bar and temp. of 120°C for about 90 minutes. This cooking process softens the fruits, enables the separation of fruits from the bunches and stops the enzymes that cause increase in FFA in the fruits.

The Extraction of Palm Oil (cont.)

❖ Threshing

In the next stage, the fruits are tipped into a rotary drum machine. The drum rotates and the fruits get lifted up and dropped when they reach the top of the drum. This action helps the detachment of the fruits from the bunches.

❖ Pressing

The fruits are conveyed to a digester which mashes up the fruitlets so that when the mash is pressed in a screw press the oil is extracted efficiently.

The press cake is transferred to Nut Station for further processing while the crude palm oil is pumped to Clarification Station for further processing.

The Extraction of Palm Oil (cont.)

❖ Power Generation

In the palm oil mill, electricity required is generated from the by-products of the palm fruits - fibre and shell.

Steam is generated from the boiler which is used to drive a steam turbine, coupled to an alternator to generate electricity.

❖ Effluent Treatment

The palm oil process uses water to separate oil from sludge and solids from tanks. The waste water (effluent) contains vegetable matter which uses oxygen in the water for decomposition. Therefore before discharge of effluent into the plantation the effluent is kept in open ponds for bacteria to decompose the vegetable matter.

Continuous Settling tanks



Sludge tank → drains → sludge pit



Clarification Station with newly installed 3-Phase Decanter



Uses of Palm Oil

□ Primary Products

- Palm oil and palm kernel oil produced from Norpalm Ghana Limited are sold to downstream food, cosmetic, detergent and chemical industries to produce soaps, margarine and cooking oil.

□ Secondary Products

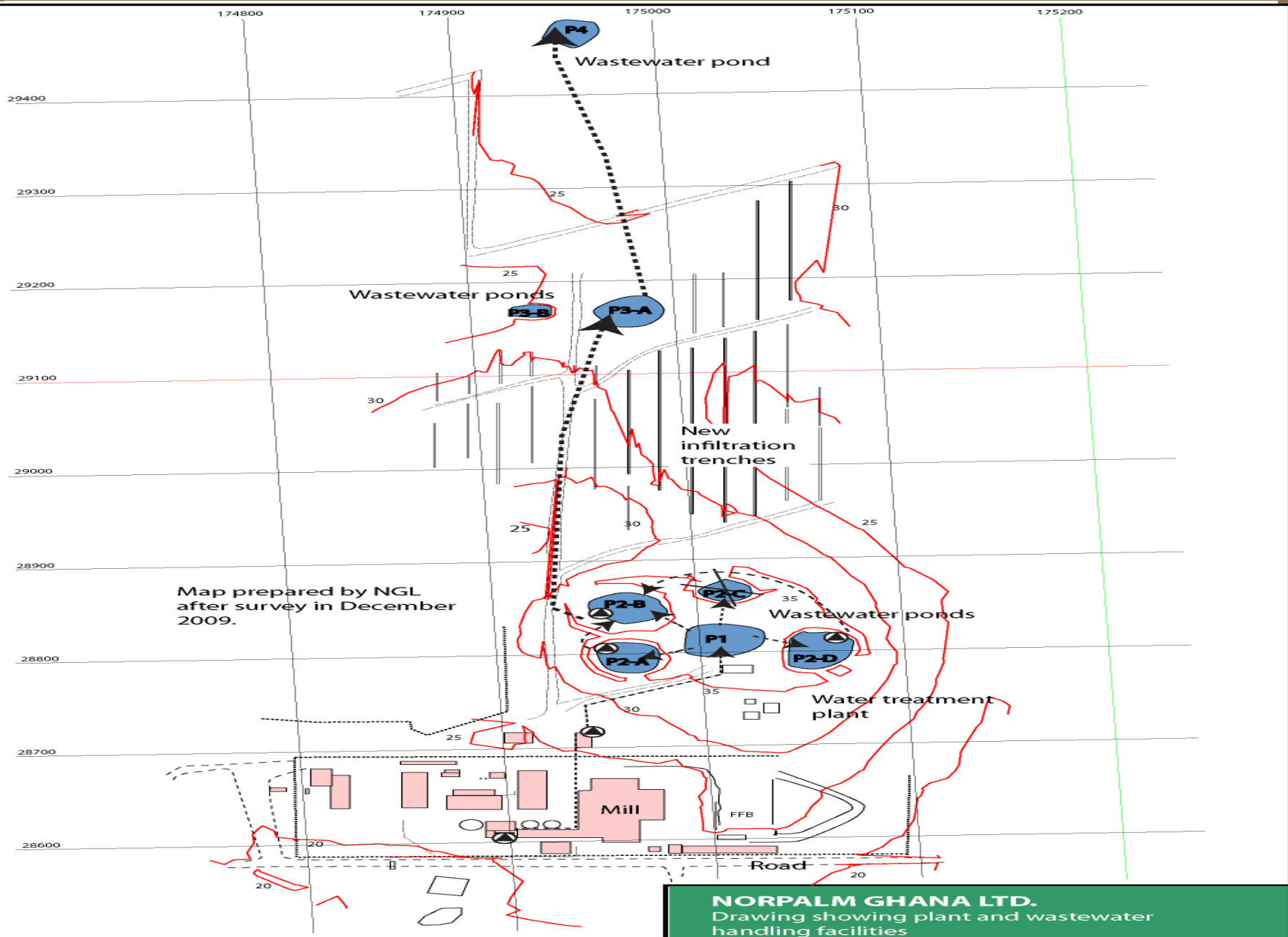
- Palm kernel cakes are sold to 3rd party buyers who used them for animal feed in the livestock sector
- Palm kernel shells and fibre are used in-house for power generation
- Empty Fruit Bunches are used in-house as mulch in the field
- Palm oil mill effluent (POME) is used for irrigating palm trees in the plantation
- POME can also generate biogas for power generation and it is under consideration as a future project.

Environmental management practices

- measure of boiler stack emission
- measure of energy consumed per ton of FFB processed
(85% of Renewable Energy to Total Power Mix including ECG and Diesel Generating Set)
New 25 tph Boiler project is ongoing and to be commissioned in 2025
- measure of water consumed per ton of FFB processed
- EFB application - as an organic fertiliser and reduces application of inorganic fertiliser.
- No burning policy

From sludge pit to effluent pond





NORPALM GHANA LTD.
Drawing showing plant and wastewater
handling facilities

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