NORTHERN TERRITORY ADMINISTRATION.

WATER RESOURCES BRANCH.

FIELD TRIP REPORT
on
WATER RESOURCES INVESTIGATION
of
N.T. PORTION 455.

REPORT NO. 1963/5.

June, 1963.

G.H. Fris, Technical Assistant
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NORTHERN TERRITORY ADMINISTRATION.
WATER RESOURCES DEPARTMENT.

FIELD TRIP REPORT.

Water Resources Investigation of N.T. Portion 455.

Party: C. H. Friel, 2/4,
L. E. Wilson, Chairman.
9th to 24th June, 1963.

SUMMARY.

N.T. Portion 455 is a Special Purpose Lease containing approximately 55 acres situated on the western side of the Stuart Highway, 117 road miles south-east of Darwin. The lease is dominated by a central ridge which contains the house buildings and domestic water storage. The rest of the lease comprises river flats along the banks of Haynes Creek, a non-perennial stream discharging into the Douglas River. An additional area of river flats on the eastern and western boundaries is under sub-lease from the surrounding pastoral lease (F.L.378). The country generally is typical Top End country with mainly light eucalyptus cover with the exception of the river flats immediately south of the house area. This section of the lease is cleared and was originally an Army cultivation area. Some of the sprinkler irrigation system is still existant.

The normal population dependent on the available water supply is 55 people (figure supplied by leasee).

Approximately 20% of these are children. A Welfare Branch school is in operation on the lease.

The buildings generally comprise a store, living area, school, storeroom, toilets, powerhouse, stable and shade. It is intended in the future to accommodate travellers. The anticipated maximum population could therefore be expected to be in the region of 50 people.

Aim of Survey.

(a) Water resources evaluation.

(b) Preliminary investigation of proposed excavated dam sites including location, catchments, and well suitability with emphasis on stock watering and domestic storage.

Access.

117 miles from Darwin, via Stuart Highway.
EXISTING WATER SUPPLIES.

The present water supply is obtained from a spring issuing from the mouth of a gorus approximately three-eighths (3/8) mile from the house area. This water is diverted through a 4-inch black-iron water pipe for approximately 650 feet where it discharges into an open drain passing through the pasture for approximately 1,430 feet. The water then replenishes a pool in Hayes Creek from which it pumped to a turkey-neck tank of concrete construction. It is then reticulated through 2-inch pipings to the house area. The flow at the discharge end of the pipe from the spring was measured at approximately 500 gallons per hour on 24th June, 1963. The delivery pipe from the pump and the reticulation system to the house are interconnected with the garden sprinkler system.

The spring appears to be the surface outlet of a sand aquifer composed of accumulated detritus in the bottom of a gorus penetrating southerly into a sandstone range for some 4,000 feet. The invert level at the head of the gorus rises some 62 feet from the spring to the base of the head of the gorus. The walls of the gorus are approximately 250 - 300 feet high, very little indication of high run-off was evident. A possible dry-site exists some 500 feet up from the spring outlet. A preliminary studia survey indicated that a 20 ft. high wall to the 450 feet contour would impound approximately 200 acre feet of water, providing that sufficient catchment exists and the site being geologically suitable.

The supply from the spring is conditioned by the average capacity of the aquifer and its permeability, if the foregoing assessment is correct. It was obvious that some of the supply from the spring was discharging into the creek bed.

Apart from a small experimental Dam known as the Chinaman Dam, with a limited capacity, no other supplies of water were available at the time of the survey. Two unsuccessful bores have already been put down by the Water Resources Branch on the property.

DATES.


Ashworth - Baseline A.E. 31°13'37.35" S.E. (from

Lands Branch), "A" being a star picket (steel) boundary marker second to the southwest from "B" and "B" being a wooden boundary marked in the most easterly corner of the block, adjacent to Hayes Creek.

Note: An unregistered E., also marked 455 exists adjacent to the most northerly corner peg. The R.L. is not known.
INVESTIGATION AND SURVEY OF DAM & EXCAVATED TANK SITES.

1. Chinaman Tank Site.

A feasibility survey of this site was carried out. The site consists of a natural depression close to Hayes Creek immediately south of the house area. Preliminary test holes indicated that the depression followed the natural rock formation, the deepest hole towards the centre of the site being 30 feet, the limit of the machine. Rock stopped the boring on the east, south and north sides. Some excavation has been carried out as an experimental measure to test the water-holding capability of the soil; this seems to be satisfactory. The centre of the depression is approximately eight feet below the level of north bank. The dam held a small quantity of water at the time of survey.

2. East Excavated Tank Site.

This consists of a shallow excavation adjacent to Hayes Creek immediately east of the eastern boundary of N. 2. Portion 49. It is about 60 feet long, ten feet broad and 0.5 to 1 ft. deep. It lies in the approximate centreline of a natural depression and towards the head of it. Preliminary test holes were not satisfactory for deep excavation. One hole struck clay at 3.5 feet, others at 7 feet, 8 feet and 12.5 feet.

3. Gully Dam Site (Part)

This site lies immediately north of the house area and consists of the bed of a watercourse between two ridges. A possibility exists here of an earthwall dam across the gully with a suitable dam on the southern side. The watercourse extends upstream beyond the Stuart Highway. No test holes were put down here.

4. Billabong Excavated Tank Site.

A suitable site exists for an excavated dam approximately half a mile west of the house area, in a small billabong located adjacent to Hayes Creek in what appears to be an original course of the stream. It is bounded on the north by a sturdy rise, and on the south and west by Hayes Creek. Preliminary test holes indicated that the soil was suitable for deep excavation with the possible exception of a rubble layer about 12 to 14 feet underground. The area is subjected to flooding.

5. West Excavated Tank Site.

A suitable site exists for an excavated dam. The area, approximately 2,000 feet in a westerly direction of the Billabong Excavated Tank site, shows good possibilities for a dam site, having reasonably gentle slopes, little likelihood of flooding, and what appears to be suitable soil. No difficulty should be experienced in establishing a well designed excavated tank on this site.
OTHER WORK CARRIED OUT.

As previously mentioned, a stadia survey of the gorge dam site was carried out. A temporary benchmark was established in an ironwood tree immediately below the suggested dam site on town datum. Stadia levels were used above this point.

A levelled traverse was run around the flat adjacent to the house area to locate relevant sites and points and stadia levels were taken to indicate the slope of the area.

The traverse was continued to the gully dam site, the Hillabong and the eastern excavated tank sites, with stadia levels where necessary. All the stations on this section of the traverse were levelled by stadia.

The spring and pipe system was located as far as the turkey-nest tank.

The flow from the spring outlet pipe was measured. No detail work was done on the house area.

Fourteen proline test holes were put down as indicated on the plan.

SUMMARY.

No large quantities of water appear to be available for irrigation.

The supply from the spring is unreliable, having failed completely during the previous dry season.

The Chinaman Dam is of limited capacity and appears to be subject to inundation during periods of high flow unless a suitable spillway is allowed for.

Test holes on the East Excavated Tank Site were inconclusive. Test holes on the Hillabong Excavated Tank site indicated suitable depth of clay soil.

The above three sites would all be subjected to flooding in any normal wet season.

The gully farm dam site appears to carry a considerable flow of water also.

The west excavated tank site test holes indicated suitable soil to depth, and although no evidence of flooding was noticed the soil contained a considerable quantity of silt. Any major flood would probably inundate this site.

The gorge dam site would impound a considerable volume of water providing a large enough catchment exists.
CONCLUSIONS.

All the sites require further test holes. The possibility of flood damage could not be ignored. The evaporation rate could be expected to be in the vicinity of 60 inches per annum. The rainfall over the last three years has been 16 inches, 16 inches and 52 inches (rainfall figures supplied by lessee). Any reliable dam would have to be so designed as to receive the maximum benefit from low rainfall and also withstand flooding. The estimate usage rate for the house at present was given by the lessee as 10,000 gallons per week. With a population of 60 people, the requirement would be in the vicinity of 20,000 gallons per week.

This supply is at present obtainable from the spring which is delivering some 34,000 gallons per week. As the spring is unreliable, however, some storage is required. This could be achieved by extending and deepening the Chinaman Dam. It could be filled by diversion from the spring outlet pipe and gravitation, preferably through a pipe. The dam would have to be fenced to prevent pollution by stock and protection drains constructed to carry away rainfall run-off. Stock could be watered by trough.

At the time of survey, 40 head of stock cattle were on the property together with four horses. 20 head of purchased cattle were elsewhere. The total of these would require some 9,000 gallons weekly. Estimated requirements for a proposed 500 head of cattle would be 70,000 gallons weekly.

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(C. H. Priel)

Technical Assistant
### APPENDIX I.

#### PUMP DETAILS.

**Engine.**
- **Make:** Southern Cross
- **Type:** Mark Y.D.H.
- **E.H.P.:** 10.8 at 1,200 r.p.m.
- **Driving Pulley:** 8" diameter, 4 x V Belt

**Pump.**
- **Make:** Southern Cross
- **Type:** E.H.O.L. Centrifugal
- **Outlet:** 1" into 2"
- **Inlet:** 1½"
- **Pulley:** 4" diameter 4 x V Belt

**Auxiliary Pump.**
- **Make:** Macdon 6
- **Type:** Double acting piston
- **Inlet:** 2"
- **Outlet:** 3½"
- **Pulley:** 2½"
- **Note:** No engine

**Bell Pump.**
- **Make:** Unable to determine
- **Type:** Morehead
- **Outlet:** 2"
- **Pulley:** 2½"
- **Note:** No engine – Decrepit

**Spare Engines.**
- **Make:** Southern Cross
- **Type:** E.U.C.
- **E.H.P.:** 4 at 1,500 r.p.m.
- **Pulley:** 4½" diameter 4 x V Belt
- **Note:** Not set up.