WESTERN NUCLEAR
ARNHEM LAND
AR 1295, 1159, 1160.
1969

FINAL REPORT ON A.P. 1295

ARNHEM LAND, N.T.

AUSTRALIA

FEBRUARY 1969

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B Mud Bay.
Roper R.
Urapunga
Alligator
Katherine
Mt Cuthbert
Mt Marumba

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A. INTRODUCTION

An area of 2,398 square miles was held by Western Nuclear (Australia) Pty. Limited under Authority to Prospect No. 1295 East and 1295 West as part of this Company's exploration programme in Arnhem Land, N.T. from September 1965 (Fig. 1). No record of mineralization in this area was previously known so a comprehensive search was planned for the common ore minerals and particularly for base metals and uranium.

The base camp for the operations in A.P. 1295 was Bulman, some forty miles northeast of Mainoru Station and 250 miles east-southeast from Darwin. The airstrip at Bulman was renovated and a vehicle track connecting Mainoru - Bulman camp - A.P. 1295 was put in by Western Nuclear.

As base maps the following geological and topographical 1:250,000 sheets (prepared by the Bureau of Mineral Resources and the Australian Army Survey Corps respectively) were used:-

SD 53 - 2	Milingimbi
SD 53 - 3	Arnhem Land
SD 53 - 5	Mount Evelyn
SD 53 - 6	Mount Marumba
SD 53 - 7	Blue Mud Bay

Aerial photo mosaics (scale 1 inch = 1 mile) have been compiled by Adastra Airways Pty. Ltd. for Western Nuclear from aerial photographs by R.A.A.F.

For field work aerial photographs 10" x 9½" (approximately scale 1" = 4,000 feet) obtained through the Department of National Development were used.

B. EXPLORATION WORK AND RESULTS

1. Airborne Magnetic, Electromagnetic and Radiometric Survey

A combined airborne magnetic, electromagnetic and radiometric survey, comprising six north-south extending reconnaissance lines one mile apart, was flown in 1966 by Adastra Hunting Geophysics in the western part of A.P. 1295 West (Map II). No anomalous values were recorded in any of the individual surveys. The small triangular shaped area (south-western corner about 134°17'E, 14°00'S) was included in a combined

magnetic, electromagnetic and radiometric survey. A strong NE-SW striking fault is postulated from interpretation of magnetic data.

2. Geochemical Stream Sediment Survey

Between September 1965 and November 1967 all major streams and tributaries over one mile long were sampled. Helicopter-supported ground crews collected samples of active sediment at quarter mile intervals. The screened minus 80 fraction of each sample was analyzed for copper, lead, zinc and silver, and the majority for cobalt and nickel as well. Sample locations and results were plotted on 1 inch = 1 mile aerial photo mosaics.

Results

Only low order anomalies were located and these were not followed up later.

a) A.P. 1295 West (Fig. 2)

i) Outcrop areas of the Birdie Creek Volcanic Member (Fanny Creek, Birdie Creek) have higher background values in Cu (average 6, max. 17 ppm) and Zn (average 10, max. 40 ppm) than the surrounding sandstones of the Kombolgie Formation (Cu $\leq$6 ppm, Zn $\leq$5 ppm)

ii) The backgrounds on creeks draining the Diljin Hill Formation (undifferentiated) vary, probably according to stratigraphic units. Areas in the upper Waterhouse River have very low values while a 13 mile long north flowing tributary draining the Diljin Hill Formation mrth of a NW-SE trending fault shows slightly higher values for Cu and Zn.

iii) Slightly higher Cu values (average 6 ppm against background of 2 ppm) occur in the eastern part of A.P. 1295 West on Quaternary sand-soil flats.

iv) Creek sediments in the upper part of the Mainoru Formation have Cu and Zn values slightly above average.

v) Higher Zn values (average 9 ppm, max. 17 ppm) occur at the upper end of a tributary of the Katherine River near intersections of north-westerly and easterly trending faults.

b) A.P. 1295 East (Fig. 3)

i) The lower Annie Creek area has Cu, Pb and Zn values several times higher than the average background for the area of 1295 East. The cause might be a possible north-eastern extension of a dolerite sill along Annie Creek. Some values above background in this area are possibly also associated with dolerite outcrops.

A.P. 1295 East is not particularly suited to a stream sampling survey since many areas are either swamps or broad sand plains and the streams carry large volumes of water during the "wet".

C. WORK SURVEY STATISTICS

Airborne scintillometer (flight hours)	3
Adastra Airborne Geophysics (line miles)	150
Total geochemical stream samples	5,912
Road building (miles)	5
Man-months worked	46.9

D. SUMMARY

A.P. 1295 was covered only in small parts by airborne geophysical surveys. No significantly conductive or radioactive anomalous areas have been recorded. Stream sediments of all major drainage systems have been sampled and analyzed for Cu, Pb, Zn, Ag and the majority for Co and Ni as well. The geochemical anomalies were not considered to be promising enough to justify further exploration work.

ARNHEM LAND REFERENCE MA

WESTERN NUCLEAR (AUSTRALIA)

SEA

ARAFURA

1

2

MILINGIMBI

3

4

ARNHEM BAY

ALLIGATOR RIVER

A.P. 1295E

5

6

7

MT. MARUMBA

8

9

MT. EVELYN

10

11

12

13

RANGE

PARSONS

A.P. 1301

14

BLUE MUD BAY

A.P. 1159

•Mt. Jean

A.P. 1443

•Mt. Marumba

Camp Bulman

A.P. 1274

•Mt. Stretton

15

16

17

18

19

A.P. 1295W

1295W A.P.

•Mt. Leane

A.P. 1160

•Mainoru

•Mountain Valley

Alpine portion of Road

KATHERINE

20

21

22

URAPUNGA

ROPER RIVER

23

24

Roper River Mission

ROPER RIVER

135°

1:250,000 SHEET REFERENCE

ALLIGATOR RIVER	MILLINGIMBI	ARNHEM BAY
MT. EVELYN	MT. MURUMBA	BLUE MUD BAY
KATHERINE	URAPUNGA	ROPER RIVER

FIG No. 1

AUTHORITY TO PROSPECT 1295

WESTERN NUCLEAR (AUSTRALIA) PTY LIMITED

SCALE: 1 – 250,000

ARNHEM LAND N.T

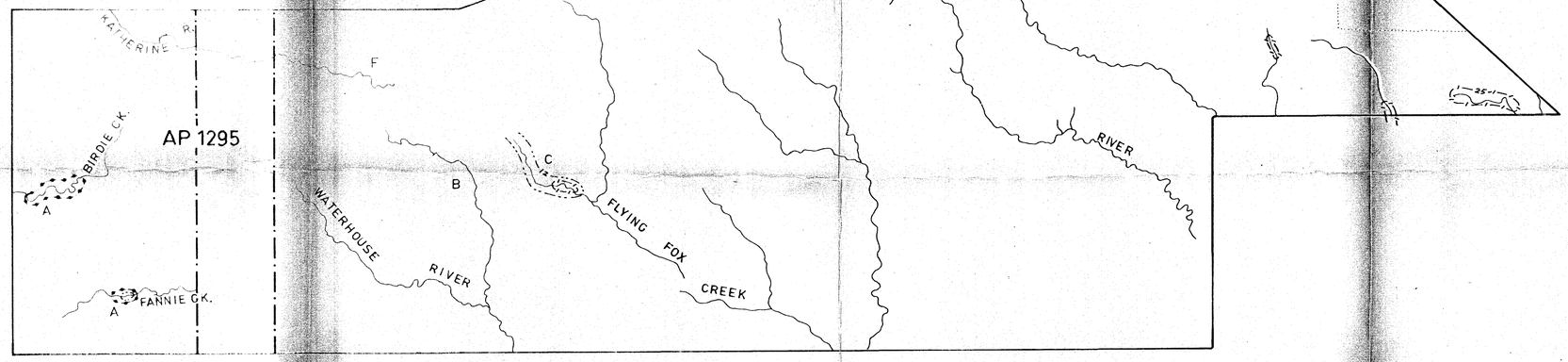
DATE: 3 · 2 · 1969

DRAWN BY: L · M · LEWIS

SEE ALSO:

AM 26·3

N



LEGEND

STREAMS SAMPLED

COPPER ANOMALIES

LEAD ANOMALIES

ZINC ANOMALIES

LIMITS OF [illegible]

15 16 MOSAIC

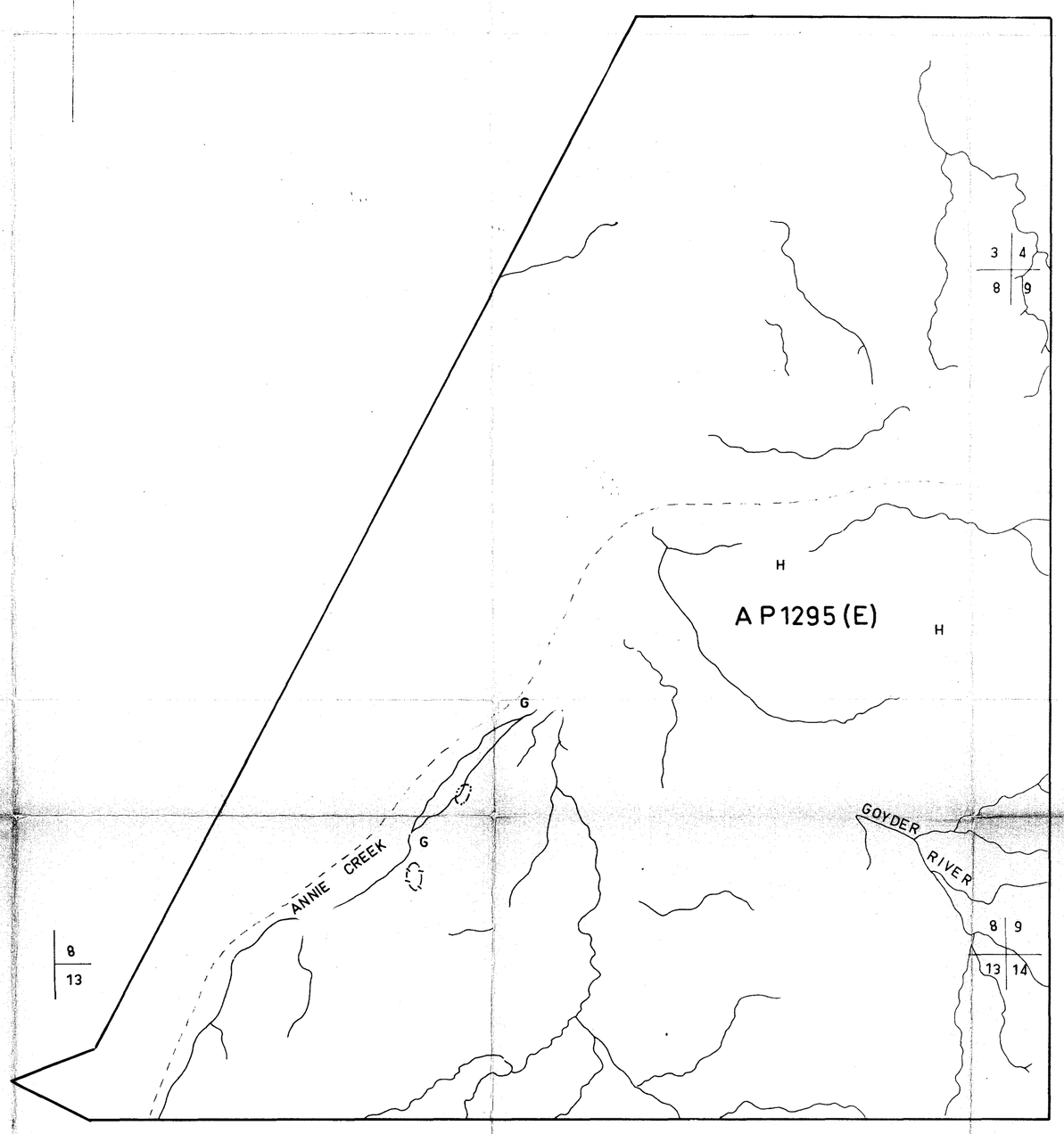
MAP

AP

FIG Nº. 2

AUTHORITY TO PRO
WESTERN NUCLEAR

N



LEGEND

- STREAMS SAMPLED
- COPPER • ANOMALIES
- LEAD ANOMALIES
- ZINC ANOMALIES
- 8 | 9 / 13 | 14 MOSAIC BORDERS
- AP BOUNDARIES
- MAIN ACCESS ROADS

FIG Nº. 3