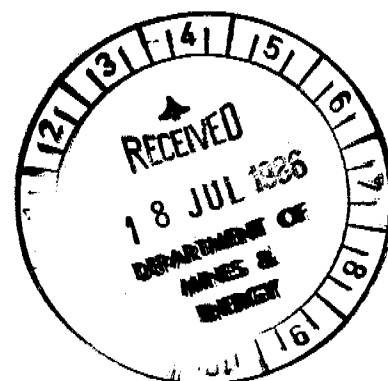


CRA Exploration Pty. Ltd.

EL 4542 COX RIVER, N.T.



ANNUAL REPORT
YEAR ENDING 20 JUNE, 1986

OPEN FILE

Submitted by : I. C. Colliver

G. J. Bubner

Accepted by : W. H. Johnston

Date : July, 1986

Copies to : * N.T. Department of Mines and Energy
CRAE Library, Darwin
CRAE Library, Canberra

Map Reference

Report number

SD 53-14 Hodgson Downs

130654

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CR 86 / 202A
NORTHERN TERRITORY
GEOLOGICAL SURVEY

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1.0 SUMMARY

A program of follow-up drainage gravel sampling was undertaken in field season 1985, to investigate the significance of scattered positive results reported from reconnaissance sampling. Five chromite grains were reported in one check sample; results were negative for the remainder.

In June 1986, a detailed low-level airborne magnetic and radiometric survey was flown over an area encompassing the southern half of EL 4542. The survey is aimed at detection of magnetic response(s) of possible chromite-source kimberlitic diatreme(s) concealed by surficial sand drift. Survey data are being processed by the contractor.

2.0 ASSESSMENT

Drainage check sampling confirmed the presence of chromite grains of no obvious provenance in the southeastern EL sector.

Results of the aeromagnetic survey are not yet available for assessment.

3.0 INTRODUCTION

Cox River EL Application 4542 was lodged on 9 March 1984 for an area of 450 blocks (about 1482 square km) and was granted on 20 June 1984 (Plan NTd 3332).

The area was taken up for exploration for diamondiferous kimberlites by way of drainage gravel sampling for detection of kimberlitic indicator minerals.

The work program completed in the first year of tenure was reported in CRAE Report 130510 (Colliver, 1985).

In summary:

Reconnaissance drainage gravel sampling was completed over the area and samples processed for detection of kimberlitic indicator minerals.

Chromite grains were reported in five samples and single microdiamonds ($<0.4\text{mm}$) in three, from sites scattered through the EL area.

Follow-up sampling was undertaken to investigate the significance of reported positive reconnaissance results. Results of this sampling were awaited at tenure year one reporting date.

Outstanding results of reconnaissance sampling, results of follow-up sampling and tenure year two exploration are discussed in this report.

4.0 DRAINAGE GRAVEL SAMPLING

Collection of drainage gravel samples was helicopter supported. Samples were forwarded to the CRAE Belmont laboratory for processing for kimberlitic indicator mineral observation and detection of microdiamonds ($<0.4\text{mm}$).

Sample locations are shown on plan NTd 3310.

Sampling data and results are tabulated in Appendix 1 and discussed below.

4.1 Field season 1984 reconnaissance infill sampling

84 -2mm sieved drainage trap site gravel samples (1082- and 1083- series numbers) were collected, giving an infilled sample density of about 1 per 13 sq km over the EL area.

[Chromite grains were previously reported (Colliver, 1985) in the following samples:

1082576 (1 grain), from a Towns River tributary creek in the far north of the EL area,

1083056 (2 grains), from a Cox tributary creek in the southeastern sector,

1083071 (1 grain), from the Cox River in the southeastern sector, and

1083120 (1 grain), from a Cox tributary creek in the southeastern sector of the EL area.

Due to a backlog at the laboratory, processing for detection of microdiamonds was deferred for these sample series.]

Subsequent processing resulted in detection of single micro-diamonds in the following samples:

- 1083052 from a Cox tributary creek, about 3.5km upstream from sample site 1083056,
- 1083070 from a Cox tributary creek on the southeastern EL boundary, and
- 1083089 from a Towns tributary creek in the northwestern sector of the EL area.

4.2 Field season 1985 follow-up sampling

A program of follow-up drainage gravel sampling was undertaken in field season 1985, to investigate the significance of scattered positive results reported from reconnaissance sampling.

13 -2mm sieved drainage trap site gravel samples (1084- series numbers) were collected, including resamples bulking more than 100kg each, taken at recovered sites of reconnaissance samples with positive results.

Samples 1084521-524, in the catchment area upstream from 1082576 (one chromite), gave negative results.

Samples 1084525-526, infill samples in the northwestern EL sector, gave negative results.

Samples 1084527, -528 and -529, resamples respectively of sites 1080653 (one chromite), 1080652 (one microdiamond) and 1083056 (two chromites), gave negative results.

Five chromite grains were reported in sample 1084530, a check sample close to site 1083120 (one chromite).

Sample 1084531, a resample of site 1080644 (one micro-diamond), gave negative results.

Sample 1084532, an infill sample in the southeastern EL sector, fortuitously about 2km upstream from site 1083070 (one microdiamond), gave negative results.

Sample 1084533, an infill sample in the southwestern EL sector, gave negative results.

5.0 AIRBORNE GEOPHYSICAL SURVEY

A review of results of drainage sampling, particularly the confirmation by check sampling of the presence of chromite grains of no obvious provenance in the southeastern EL sector, led to a decision to contract a detailed aeromagnetic survey.

The aim of the survey is to detect magnetic response(s) of possible chromite-source kimberlitic diatreme(s) concealed by surficial drift sand.

5.1 Control Photography

On 16th May 1986, new high-level black and white aerial photography was acquired over the tenement area by Qasco Northern Surveys Pty.Ltd., using a Wild RC10 super wide angle camera. The photography was flown on three north-south runs with 60% forward overlap, and was delivered as diapositives and 1:60 000 contact prints.

1:25 000 enlargements of this photography were used for navigation and flight path recovery of the airborne geophysical survey. To establish control, nine photogrammetric control points were plotted on alternate frames by Qasco Pty.Ltd., Brisbane.

5.2 Survey Parameters

In June 1986, detailed low-level airborne magnetics and radiometrics data were acquired over an area encompassing the southern half of EL 4542 (Plan NTd 4093).

In summary, specifications of the survey were:

Survey name	: Cox River
Survey area	: 996 square kilometres
Flight line direction	: 045 - 225 degrees True
Flight line spacings	: 300 metres
Mean terrain clearance	: 80 metres
Contractor	: Austirex International Pty.Ltd. (acquisition and processing)
Magnetometer	: Scintrex VIW 2321 alkali vapour
Sample interval	: 0.25 seconds (15 metres)
Spectrometer	: Exploranium GR-800D
Crystal volume	: 33 litres (2,048 cubic inches)
Flying commenced	: 9th June 1986
Flying completed	: 16th June 1986
Line km.	: 3,765 (including tielines)

The airborne survey data are being processed by Austirex.

6.0 REFERENCES

- Colliver, I.C. 1985: EL 4542 Cox River, N.T.
Annual report year ending 19 June 1985
CRAE report 130510
- Dunn, P.R. 1963: Hodgson Downs, N.T.
BMR 1:250 000 Geological Series
Explanatory Notes

7.0 KEYWORDS

Diamonds, diamond indicators, airborne, geophys-mag,
geophys-rad, sampling-drainage

8.0 LOCATION

SD 53-14 Hodgson Downs (5866 Cox)

9.0 LIST OF PLANS

Plan No -----	Title -----	Scale -----
NTd 3332	Location Plan Cox River EL 4542	1:250 000
NTd 4093	Cox River EL 4542 Airborne geophysical survey sheet index & Plan numbers	1:250 000
NTd 3310	Cox River EL 4542 Sample location Plan	1:100 000

1

Appendix 1

INDICATOR MINERAL SAMPLING DATA

03-JUL-86

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*      *****
*      *      *      *      *      *
*      *      *****      *      *
*      *      *      *      *      *
*      *      *      *      *      *
*****

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A PROGRAM IN THE GASP SYSTEM TO
PRINT A LISTING OF A DATA SET

VERSION 4.0 AUG 1983.

DATA TITLE: McARTHUR BASIN SAMPLING/I.M.RESULTS

LISTING OF ARCHIVAL INFORMATION FOR THE INPUT DATA

BROADMERE CAMP 2/1984 (June-August, September, November)
RECONNAISSANCE EXTENSION, INFILL AND FOLLOW-UP SAMPLING

SAMPLE NOs. 1082279 - 1082600	DPD's 21912, 21911, 21927
	(20744 petrology)
1082922 - 1083100	21913, 21927
1083101 - 136	
1083146 - 153	21927
1083161 - 166	
1083180 - 186	21926
641751 - 641778	[Tanumbirini Sn investigation]
	DPD's 21927, (20930 geochem)
641779 - 791	21927
681600 - 681607	
681608 - 609	21928, (20931 geochem)
	(20932 petrology)
681612 - 613	21940
881378 - 881382	21938

PERSONNEL: I.C.Colliver, S.L.Allnutt, D.A.Simms,
R.G.Henderson, B.E.Harvey

Extension of reconnaissance drainage sampling coverage
(at ~1 : 12km² sample density) over the Mantungula and Cox
100 000-sheet areas, closing with sampling coverage from
Hodgson River Camp 3/1984, infill drainage sampling
in peripheral areas of previous reconnaissance sampling,
follow-up of positive results of previous sampling and
ground investigation and sampling of magnetic anomalies
selected from 1983 airborne surveys.

Drainage trap site selection, aeromagnetic anomaly and photocircular feature recovery, ground surveys and sample collection all helicopter supported.

Drainage samples sieved -2mm (generally 1x20kg bag per site) Kraft packet -80mesh geochemical sample sieved on site from active drainage sediment

Loam samples comprise 3-5 bags per site of (-2mm) deflated surficial soil, shallowly scraped over areas of several m2.

TANUMBIRINI CAMP 2/1985 INFILL AND FOLLOW-UP SAMPLING (June)

SAMPLE NOs. 1084500 - 1084564

DPD NO. 21947

PERSONNEL: I.C.Colliver, J.P.Howard, J.H.Lew

Infilling areas of low density reconnaissance sampling and follow-up of positive reconnaissance sampling results in areas of retained "Nutwood Block" EL's 4541, 4542, 4545 and 4548.

Trap site selection and sample collection helicopter supported

Drainage samples sieved -2mm (1-5 x 20 kg bags per site)

Kraft packet -80mesh geochemical sample sieved on site from active drainage sediment.

LABELS LEGEND

EAST |
| A.M.G. coordinates (km) including zone
NORTH |

SAMTYPE SAMPLE TYPE
coded 1 = drainage (1.2 = pan con.)
2 = loam
3 = rock
3.1 = outcrop
3.2 = float
3.3 = auger cuttings
3.4 = RD/PD
3.5 = DD core

SAMKG SAMPLE WEIGHT (kg)

IND1 KIMBERLITIC INDICATOR MINERAL GRAINS OBSERVED
(1.CR = 1 chromite)

IND2 INDICATOR MINERAL #2 OR OTHER MINERAL OF INTEREST

MICROD NUMBER OF MICRODIAMONDS RECOVERED

***** INFORMATION ADDED BY CRUNCH *****

** COORDINATE TRANSFORMATION

THE LOCAL GRID VARIABLES EAST AND NORTH WERE TRANSFORMED TO
AMG COORDINATE VARIABLES EASTAMG AND NORTHAMG IN ZONE 53

THE FOLLOWING SELECTION CRITERIA WILL BE SATISFIED IN THIS RUN.

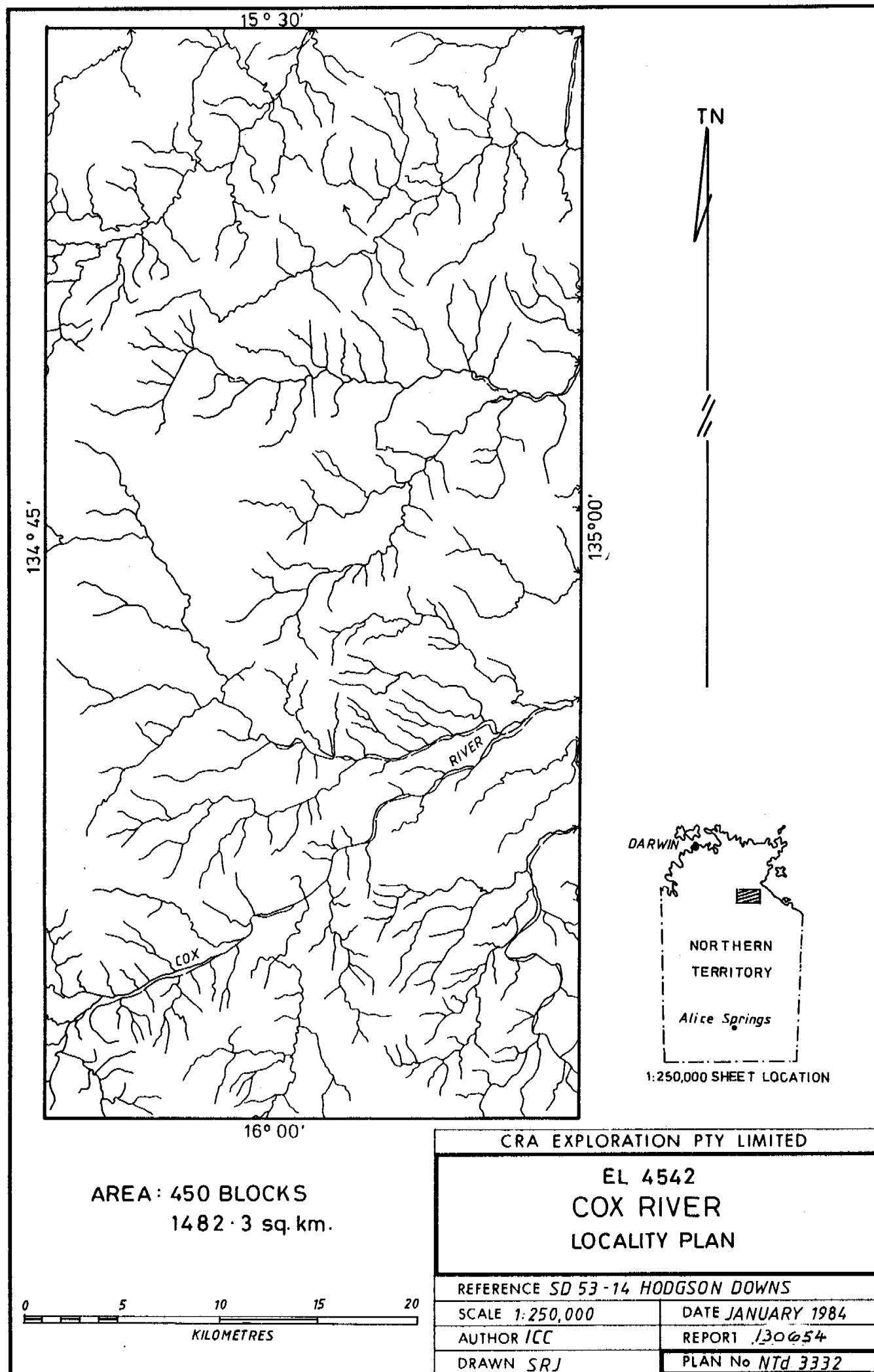
SAMPLES WITH
EASTAMG BETWEEN 473000.000 AND 500500.000
AND
NORTHAMG BETWEEN 8231000.000 AND 8286500.000
WILL BE SELECTED.

SAMPLE NO.	EASTAMG	NORTHAMG	SAMTYPE	SAMKG	IND1	IND2	MICRO
1082515	498199	8286300	1	23.5	0	0	0
1082516	496398	8280500	1	24.2	0	0	0
1082517	496398	8280500	1	27.2	0	0	0
1082527	499898	8285900	1	24.1	0	0	0
1082551	494601	8285400	1	22.2	0	0	0
1082556	476699	8285300	1	26.7	0	0	0
1082575	484199	8283599	1	23.8	0	0	0
1082576	484199	8283599	1	21.5	1.CR	0	0
1082577	480898	8279800	1	23	0	0	0
1082578	480898	8279800	1	20.7	0	0	0
1082579	476199	8276200	1	22.9	0	0	0
1082580	476199	8276200	1	22.5	0	0	0
1082581	483101	8282700	1	24.3	0	0	0
1082582	484500	8282200	1	23.8	0	0	0
1082583	482300	8279300	1	22.5	0	0	0
1082584	480199	8279099	1	22.8	0	0	0
1082585	476800	8275200	1	26.1	0	0	0
1083040	473500	8234800	1	29.6	0	0	0
1083044	474199	8234700	1	27.9	0	0	0
1083046	485398	8234300	1	25.7	0	0	0
1083047	485800	8234099	1	25.5	0	0	0
1083051	492300	8241599	1	24.3	0	0	0
1083052	494500	8241200	1	22.7	0	0	1
1083053	496199	8239700	1	20.3	0	0	0
1083054	499300	8237500	1	24.9	0	0	0
1083055	498500	8235099	1	22.7	0	0	0
1083056	496800	8243500	1	26.9	2.CR	0	0
1083057	493601	8242900	1	24.8	0	0	0
1083058	498199	8241800	1	25.5	0	0	0
1083059	495500	8239400	1	27.6	0	0	0
1083060	494398	8237400	1	24.2	0	0	0
1083061	497500	8234800	1	23.9	0	0	0
1083064	497898	8252099	1	24.5	0	0	0
1083065	495199	8251500	1	25.4	0	0	0
1083066	495000	8237599	1	26	0	0	0
1083067	498101	8234700	1	27	0	0	0
1083070	500199	8250800	1	24.6	0	0	1
1083071	495500	8250099	1	29.4	1.CR	0	0
1083072	488601	8249099	1	24.2	0	0	0
1083073	487000	8250000	1	24	0	0	0
1083074	487500	8242800	1	23.5	0	0	0
1083075	493898	8250700	1	27.7	0	0	0
1083076	487000	8249500	1	28.6	0	0	0
1083077	488699	8244900	1	26.8	0	0	0
1083078	483601	8240700	1	24	0	0	0
1083079	482000	8239900	1	22.8	0	0	0
1083080	486398	8242099	1	27.4	0	0	0
1083081	484699	8239200	1	24.6	0	0	0
1083082	485000	8239099	1	28	0	0	0
1083083	488398	8239700	1	22	0	0	0

SAMPLE NO.	EASTAMG	NORTHAMG	SAMTYPE	SAMKG	IND1	IND2	MICRO
1083084	486800	8235400	1	23.2	0	0	0
1083085	479601	8238900	1	24.8	0	0	0
1083086	479800	8237700	1	26.4	0	0	0
1083087	474101	8237900	1	29.5	0	0	0
1083088	473699	8237400	1		0	0	0
1083089	475699	8274700	1	24.8	0	0	1
1083090	473601	8236099	1	23.5	0	0	0
1083091	479398	8238200	1	21.4	0	0	0
1083094	473898	8271700	1	20.3	0	0	0
1083101	485898	8273900	1	21.8	0	0	0
1083104	475398	8275400	1	23.4	0	0	0
1083103	499101	8280400	1	21.6	0	0	0
1083106	481199	8272200	1	22.8	0	0	0
1083108	492898	8278800	1	24	0	0	0
1083107	495800	8277000	1	24.6	0	0	0
1083110	486601	8274800	1	26.2	0	0	0
1083109	491300	8277000	1	22.8	0	0	0
1083112	497000	8258400	1	23.6	0	0	0
1083114	490699	8278500	1	23.2	0	0	0
1083113	489199	8262800	1	20.8	0	0	0
1083115	490500	8278400	1	22.8	0	0	0
1083118	487199	8262200	1	23.5	0	0	0
1083119	487199	8262200	1	25.8	0	0	0
1083117	496898	8257599	1	24.4	0	0	0
1083121	483800	8249800	1	23.9	0	0	0
1083120	491601	8253500	1	21.8	1.CR	0	0
1083123	489800	8256700	1	22.4	0	0	0
1083122	483699	8247099	1	24.2	0	0	0
1083125	481898	8253700	1	20.9	0	0	0
1083124	494699	8254200	1	25.2	0	0	0
1083127	480300	8246599	1	22.8	0	0	0
1083126	483398	8246500	1	22.6	0	0	0
1083129	477800	8249099	1	22.5	0	0	0
1083128	480500	8245700	1	24.4	0	0	0
1083133	476300	8252300	1	13.2	0	0	0
1084521	482199	8285700	1	29.4	0	0	0
1084522	483500	8281599	1	57	0	0	0
1084523	482000	8285400	1	26.8	0	0	0
1084524	476898	8285000	1	25.4	0	0	0
1084525	473500	8277099	1	20.9	0	0	0
1084526	473398	8276700	1	25.7	0	0	0
1084527	486199	8258099	1	112.6	0	0	0
1084528	478199	8260700	1	125.9	0	0	0
1084529	496800	8243400	1	132	0	0	0
1084530	491699	8243300	1	132.4	5.CR	0	0
1084531	498800	8267700	1	106.4	0	0	0
1084532	498800	8249400	1	25.3	0	0	0
1084533	476199	8252800	1	25.2	0	0	0

END

NUMBERS THAT ARE CODED REPRESENT "SPECIAL VALUES".
 THESE VALUES WILL BE EXCLUDED FROM ALL CALCUALTIONS IN THE
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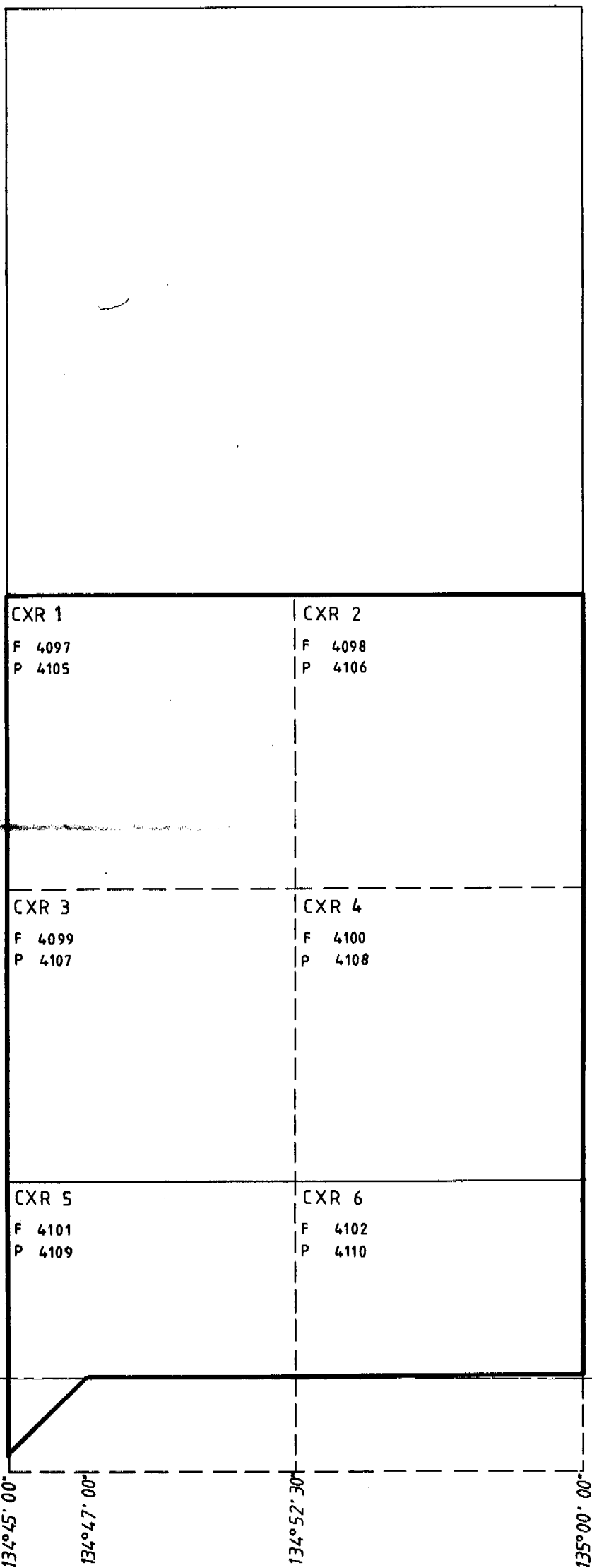
15° 45' 00"

15° 52' 30"

16° 00' 00"

16° 05' 00"

16° 07' 00"
16° 07' 30"



FLIGHT LINE DIRECTION 045°-225°
FLIGHT LINE SPACING 300 metres

INDEX

F FLIGHT PATH MAP PLAN No. NTd
P STACKED MAGNETIC PROFILES PLAN No. NTd
— AIRBORNE SURVEY BOUNDARY
— EL BOUNDARY
- - - 1:25,000 SHEET BOUNDARIES

LOCATION

HODGSON DOWNS SD53-14
TANUMBIRINI SE53-2
COX 5866
TANUMBIRINI 5865

CRA EXPLORATION PTY LIMITED

COX RIVER - EL4542

AIRBORNE GEOPHYSICAL SURVEY
Survey Boundary, Sheet Index & Plan No's

REFERENCE *HODGSON DOWNS SD53-14*

SCALE 1:250,000

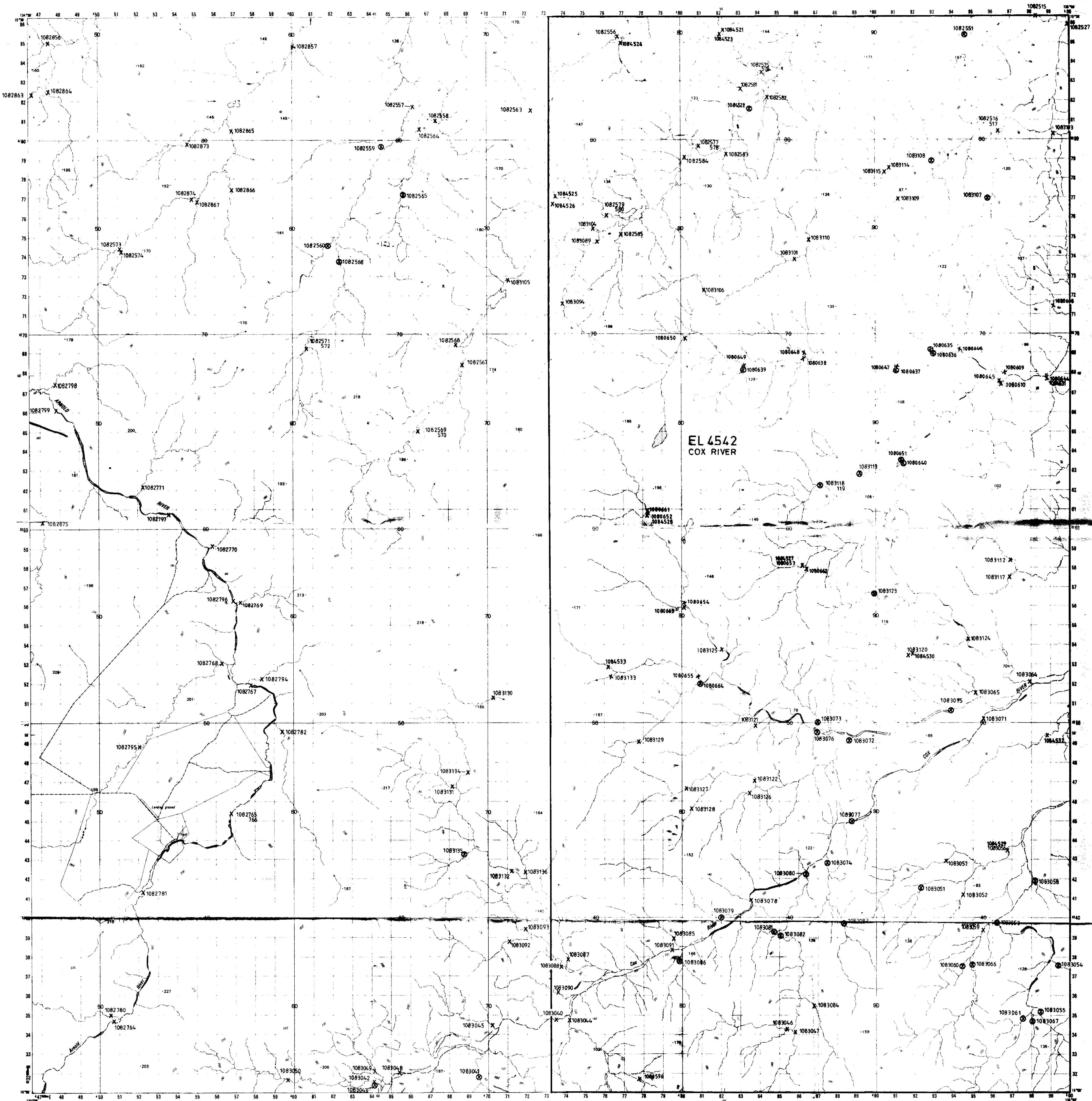
DATE JANUARY 1986

AUTHOR GJB

REPORT No. 130654

DRAWN SRJ

PLAN No. NTd 4093



SCALE 1:100 000

LEGEND

X DRAINAGE SAMPLE
G GOOD SITE

BLACK NUMBERED GRID LINES ARE 1000 METRE INTERVALS OF THE AUSTRALIAN MAP GRID, ZONE 50
GRID VALUES ARE SHOWN IN FULL ONLY AT THE SOUTH WEST CORNER OF THE MAP
HORIZONTAL DATUM: AUSTRALIAN GEODETIC DATUM 1986
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
TRANSVERSE MERCATOR PROJECTION
CONTOUR INTERVAL 20 METRES
ELEVATIONS IN METRES

Build-up area, National route marker
Principal road and highway: Cutting
Secondary road, Embankment
Minor road: Road bridge
Vehicular track
Gate, Cattle grid
Railway, multiple track: Station: Railway bridge
Railway, single track: Railway tunnel
Light railway or tramway
Power transmission line
Fence: Levee or bank
Mine: Windmill: Quarry
Building: Church: Ruin: Drive in theatre
Trig station: Bench mark: Spot elevation
Cliff: Contour with value: Depression contour
Forest, dense, medium, scattered
Savanna, dense, medium, scattered
Tropical rainforest: Pine plantation
Orchard, plantation or vineyard: Mangrove
Windbreak
Lake, perennial: Stream, perennial
Lake, intermittent: Stream, intermittent
Lake, mostly dry: Stream, mostly dry
Swamp, perennial: Intermittent
Land subject to inundation: Rice field
Dune or wall: Spring: Tank or small dam
Breakwater: Pier: Wharf
Wood, exposed: Lighthouse
Rock, bare or scree: Foreshore flat: Sand
Reef: Rock ledge

TRUE NORTH, GRID NORTH AND MAGNETIC NORTH ARE SHOWN DIAGRAMMATICALLY FOR THE CENTRE OF THE MAP. MAGNETIC NORTH IS CORRECT FOR 1974 AND MOVES BY LESS THAN 1° IN TEN YEARS

CRA EXPLORATION PTY. LIMITED	
EL 4542 COX RIVER	
SAMPLE LOCATION PLAN	
REFERENCE SD53-14 HODGSON DOWNS	
SCALE 1:100,000	DATE JUNE 1985/86
AUTHOR ICC	REPORT 130654
DRAWN SRJ	PLAN NO. NTD 3310

PRODUCED by the Division of National Mapping under the direction of the Minister for Minerals and Energy, as part of the national mapping programme.
PRINTED by authority of the Minister for Minerals and Energy, 1974.
DISTRIBUTED by the Department of Minerals and Energy.
MAP ACCURACY: The average accuracy of this map is ± 25 metres in the horizontal position of well defined detail and ± 2.5 metres in elevation.
MAP RELIABILITY: Topographic information shown on this map is correct in 1972.
ROAD CLASSIFICATION: Roads are classified according to their intended function as part of the national road system.

GRID REFERENCE	
TO GIVE A UNIQUE REFERENCE ON THIS SHEET TO NEAREST 100 METRES	
IGNORE THE SMALLER FIGURES OF ANY GRID NUMBER: THESE ARE FOR FINDING THE FULL CO-ORDINATE. USE ONLY THE LARGEST FIGURES OF THE GRID NUMBER, E.G. 442000	
SAMPLE POINT: 1: 100 000 map sheet	5886
2: Locates first VERTICAL grid line to LEFT of point and read LARGE figures labelling the line which is the top or bottom margin or on the line itself	54
3: Estimate tenths from grid line to point	
4: Locate first HORIZONTAL grid line BELOW point and read LARGE figures labelling the line in either the left or right margin, or on the line itself	44
5: Estimate tenths from grid line to point	3
SAMPLE REFERENCE	5886-54-443