Arafura Resources NL – Exploration Division

INTRODUCTION TO THE GEOLOGY OF THE NOLANS BORE REE/P/U DEPOSIT

by

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BASED ON
TECHNICAL REPORTS EPL-99/101,
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&

SEM STUDY OF NOLANS BORE SAMPLES
By
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Nolan's Bore Prospect October. 2005

NOLANS BORE REE DEPOSIT

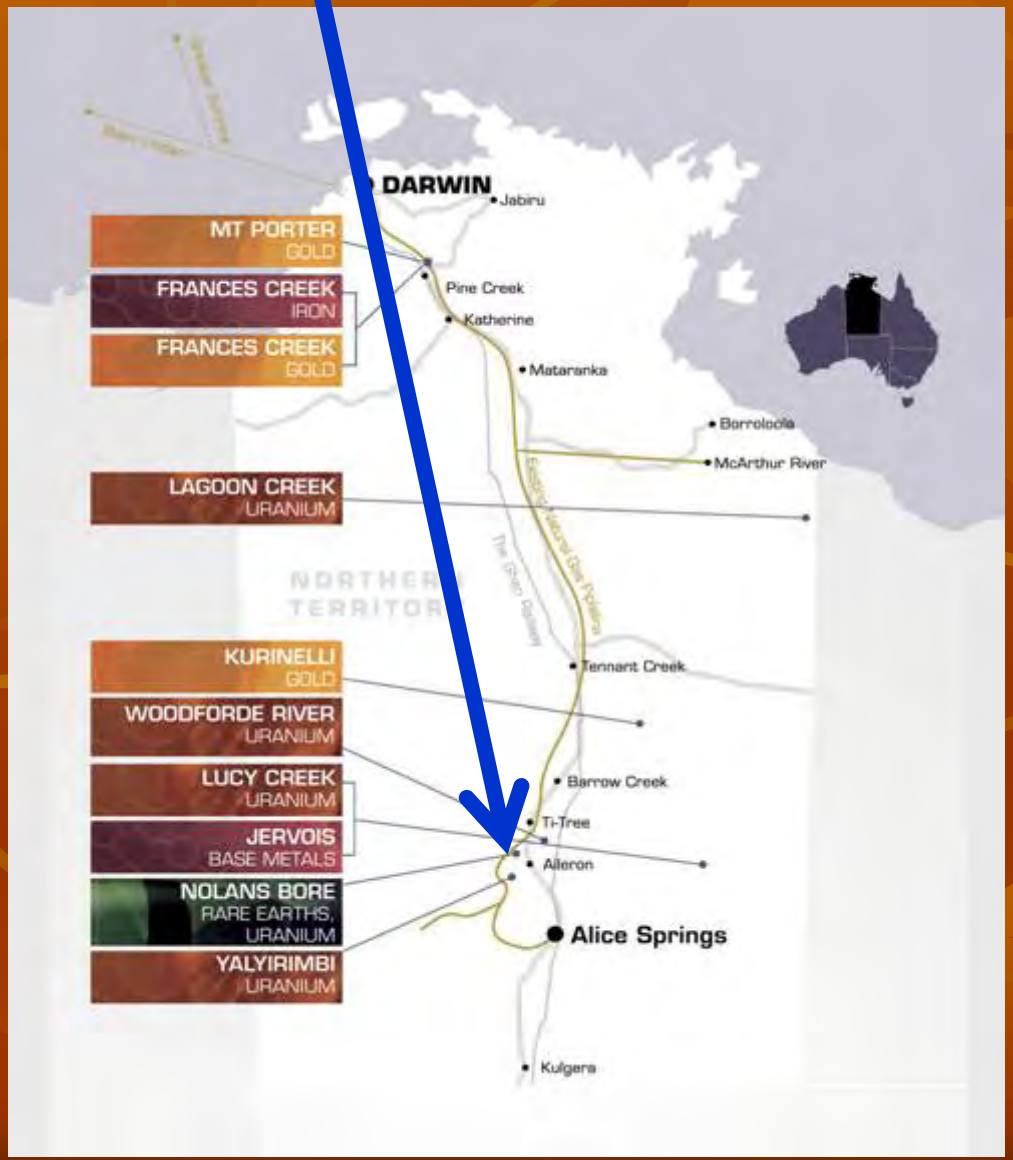
Presentation Content

I - EXPLORATION & RESOURCES

II – GEOLOGY

III - MINERALOGY

NOLAN'S BORE LOCATION



NOLANS BORE REE DEPOSIT

I - EXPLORATION & RESOURCES

II – GEOLOGY

III - MINERALOGY

NOLANS BORE EXPLORATION

ARAFURA RESOURCES NL 1999-2006

- 1999 - COMPREHENSIVE SURFACE CHIP SAMPLING - 32 SAMPLES AVERAGE ABOUT 7% TOTAL REE
- 2000 - 890 M OF COSTEANING AND 9 PITS, MAPPING & SAMPLING
- 2001 - 856 M OF RC DRILLING IN 12 RC HOLES. MAX 96 M EOH.
- 2004 – 1525 M OF RC DRILLING IN 20 HOLES AND 571 M CORE DRILLING IN 5 HOLES (INCL NTGS CORE HOLE). MAX 120 M EOH.
- 2005 – 7532 M RC DRILLING IN 58 HOLES AND 1038 M CORE DRILLING IN 12 HOLES (INCLUDING EXTENSIONS). MAX 241 M EOH.
- 2005 – GEOLOGICAL MAPPING 3 KM RADIUS
- 2006 – 3500 M RC DRILLING PROGRAM CURRENTLY UNDERWAY

NOLAN'S BORE IDENTIFIED MINERAL RESOURCES

21/11/05 (JORC Compliant)

	MT	REO%	REO (kt)	P_2O_5%	U_3O_8 lb/t
High grade	3.9	4.4	174	18.3	0.70
Medium grade	6.6	2.4	158	11.1	0.37
Total Indicated	10.5	3.1	332	13.8	0.50
Total Inferred	8.1	3.0	245	14.3	0.43
TOTAL	18.6	3.1	577	14.0	0.47

NOLANS BORE REE DEPOSIT

I - EXPLORATION & RESOURCES

II – GEOLOGY

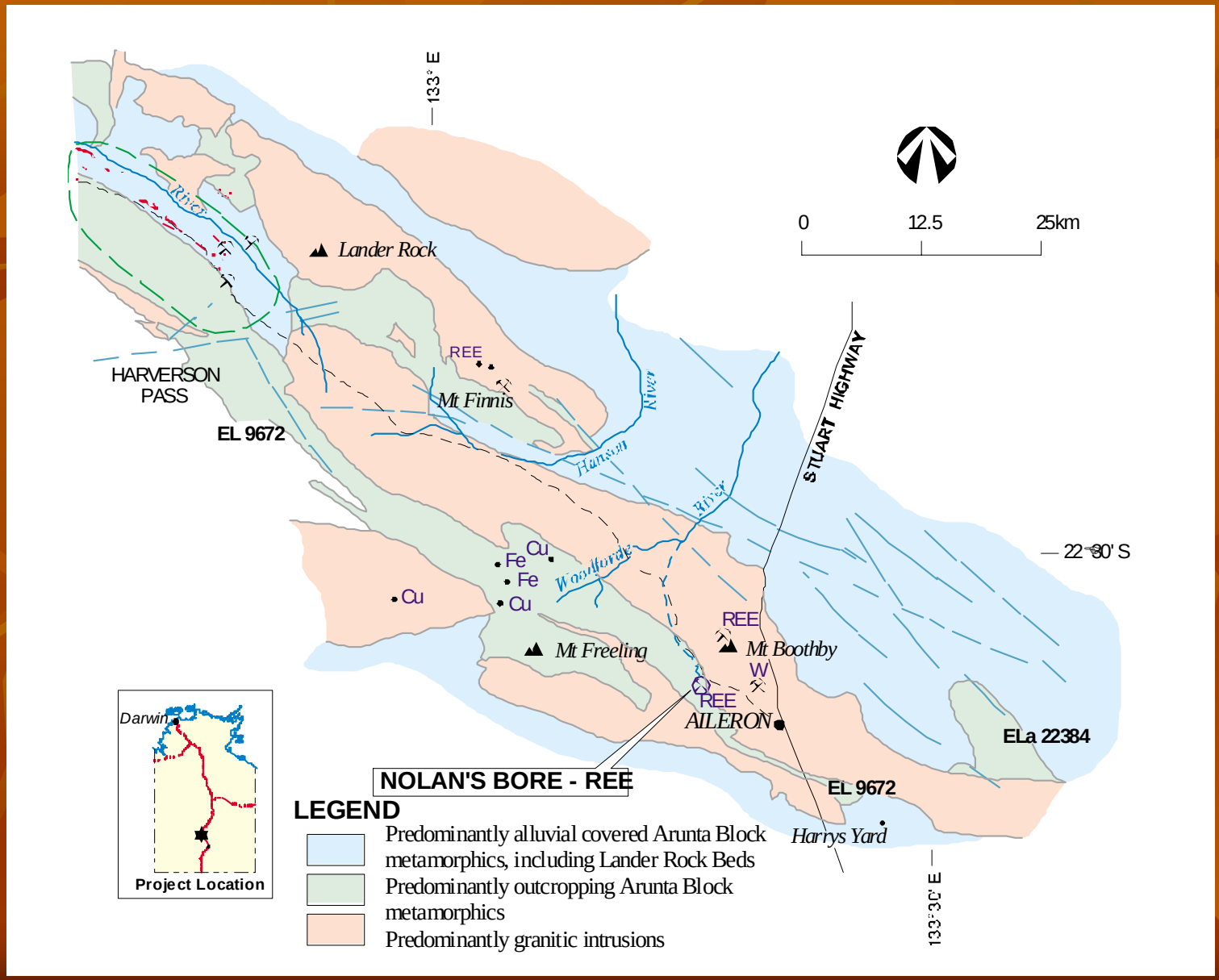
a) Setting

b) Mineralisation

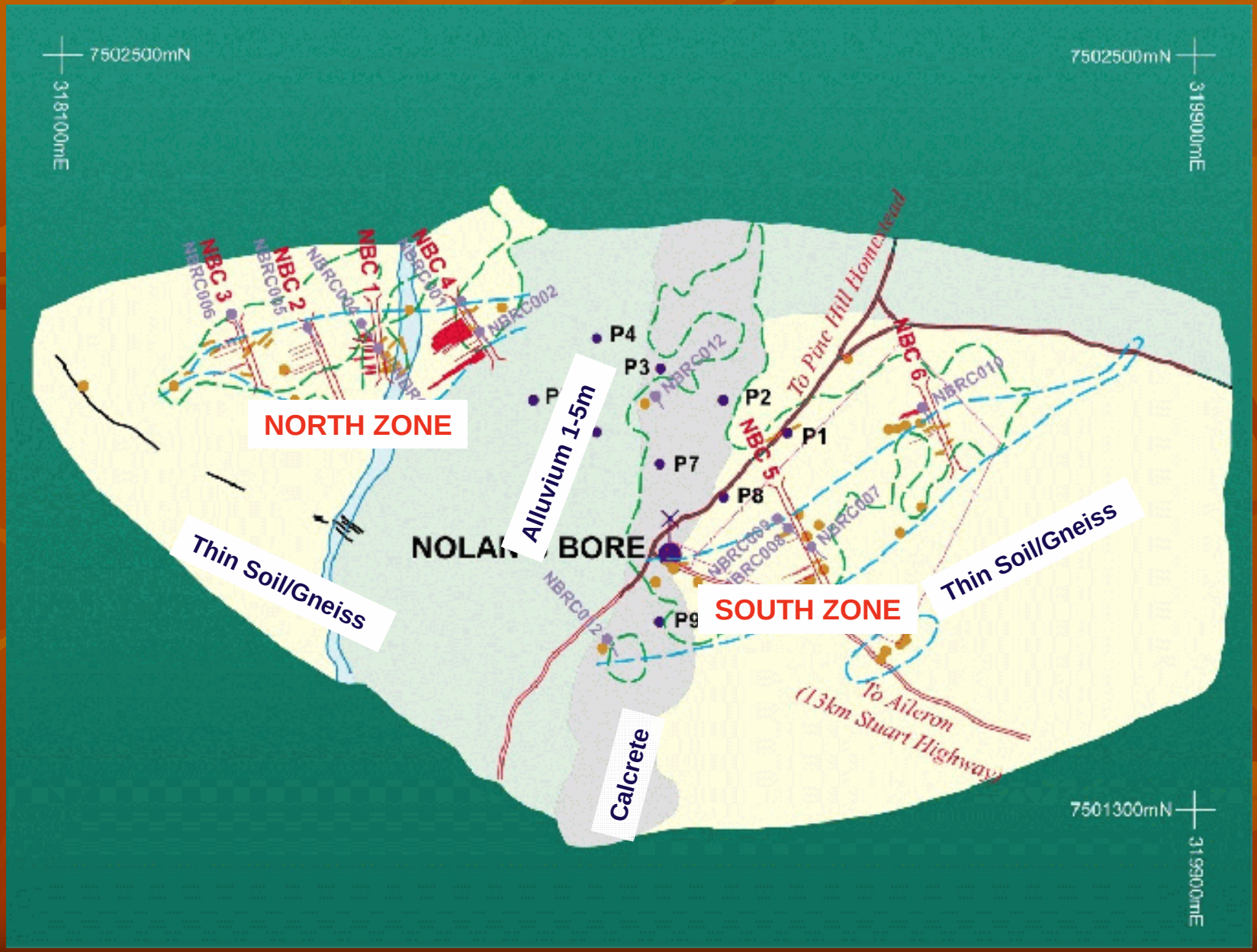
c) Host rocks

III - MINERALOGY

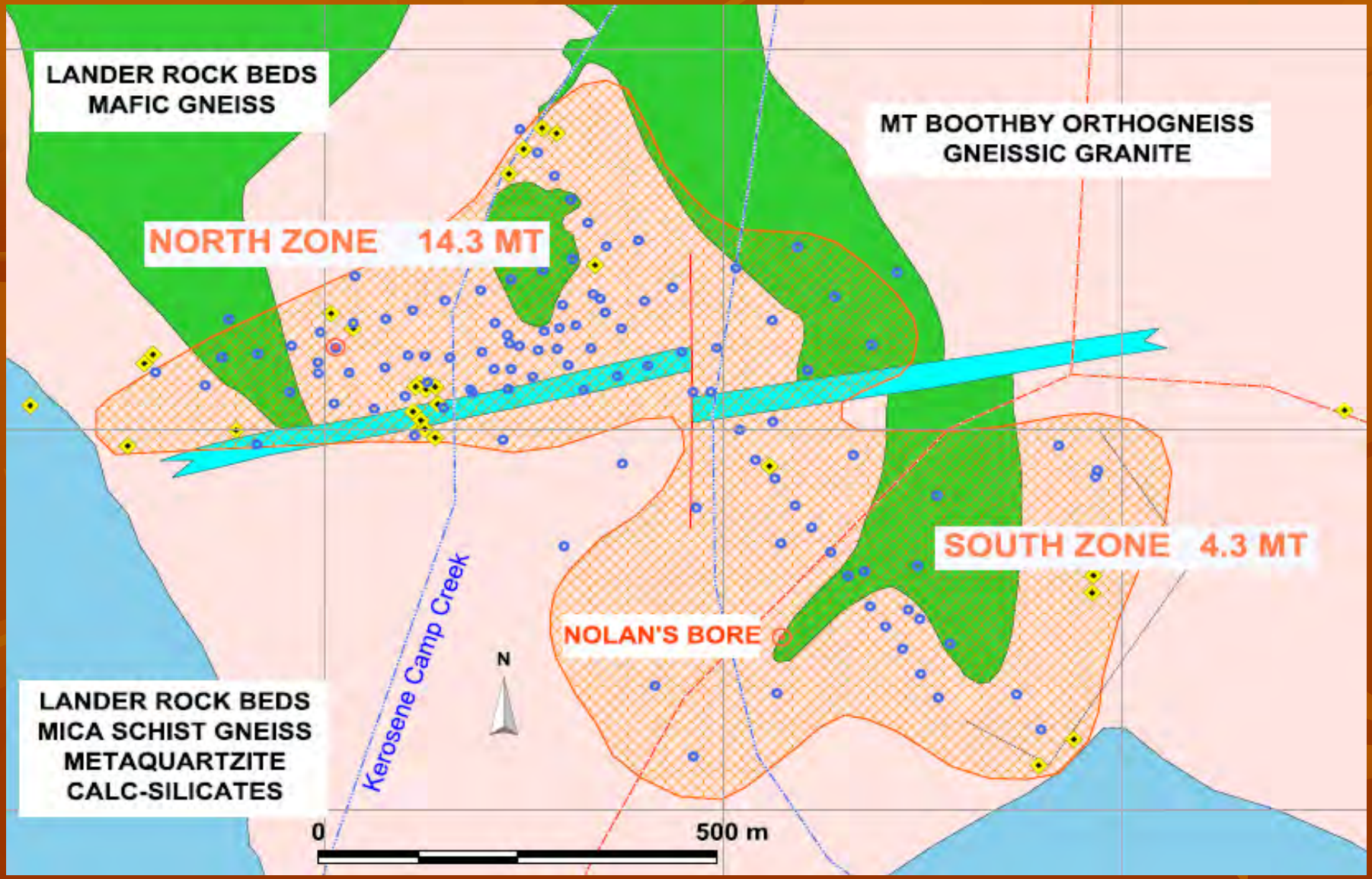
NOLANS BORE REGIONAL GEOLOGY



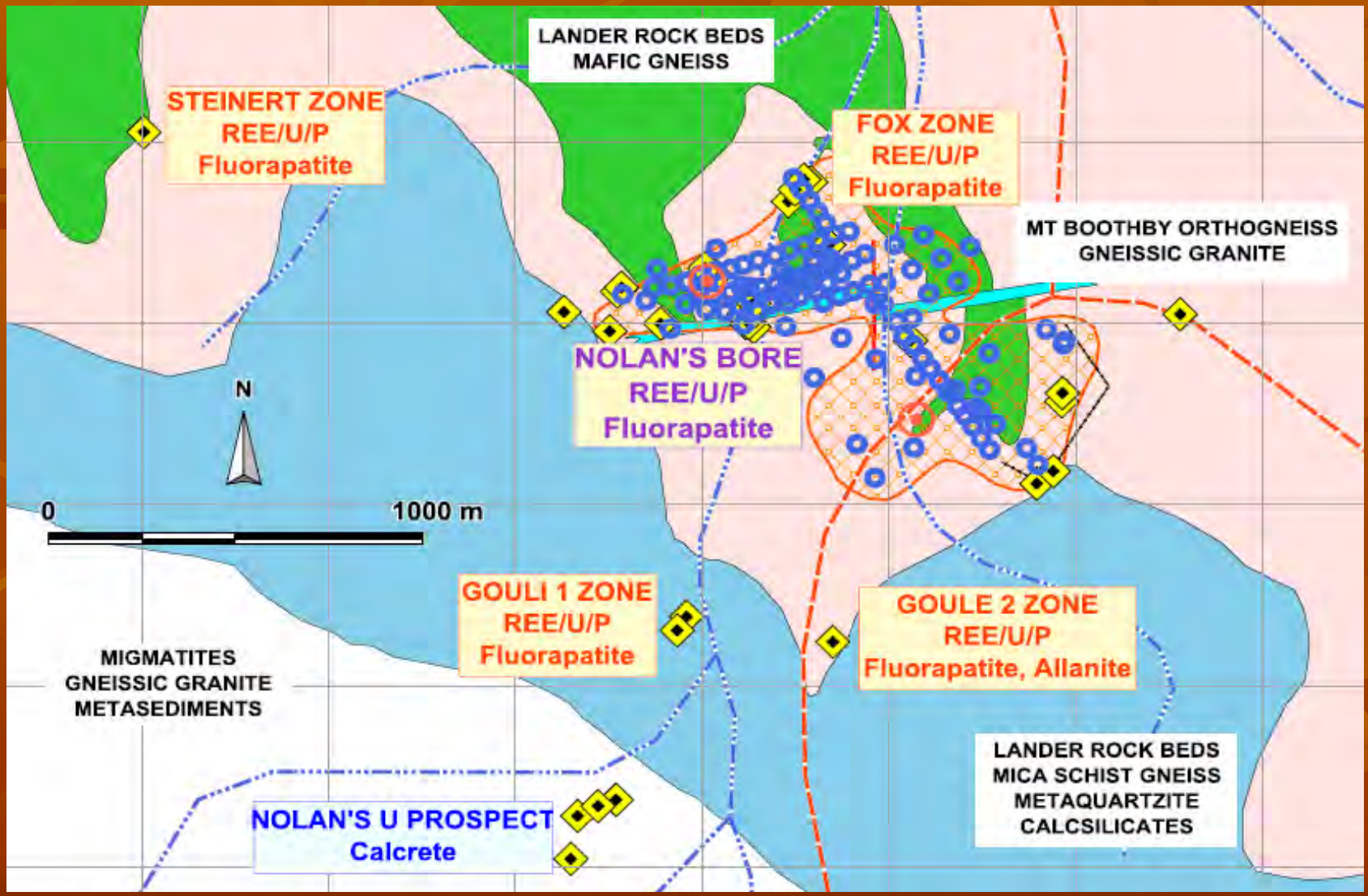
NOLANS BORE SURFACE GEOLOGY



NOLAN'S BORE BASEMENT GEOLOGY

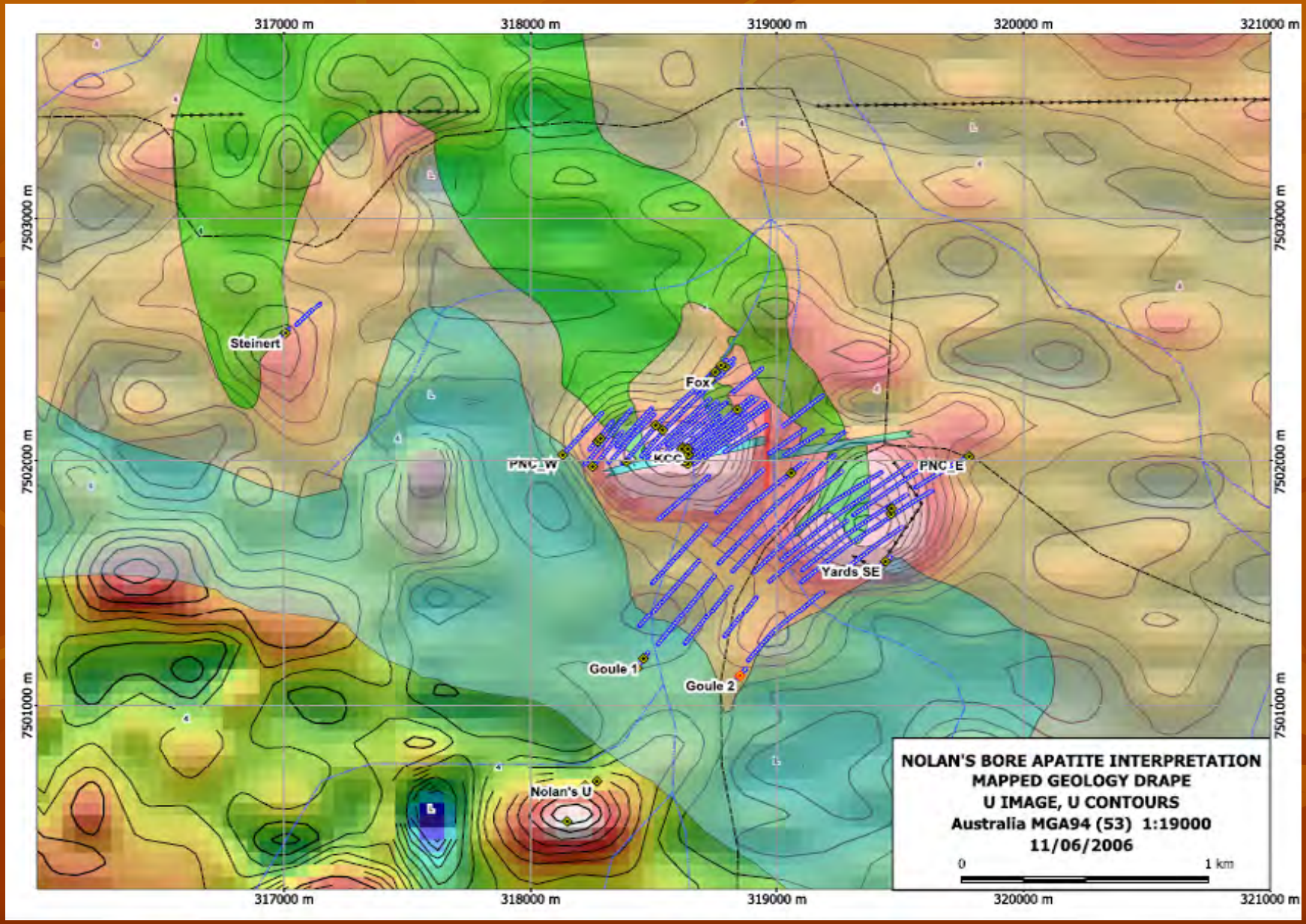


NOLAN'S BORE BASEMENT GEOLOGY AND LOCAL PROSPECTS

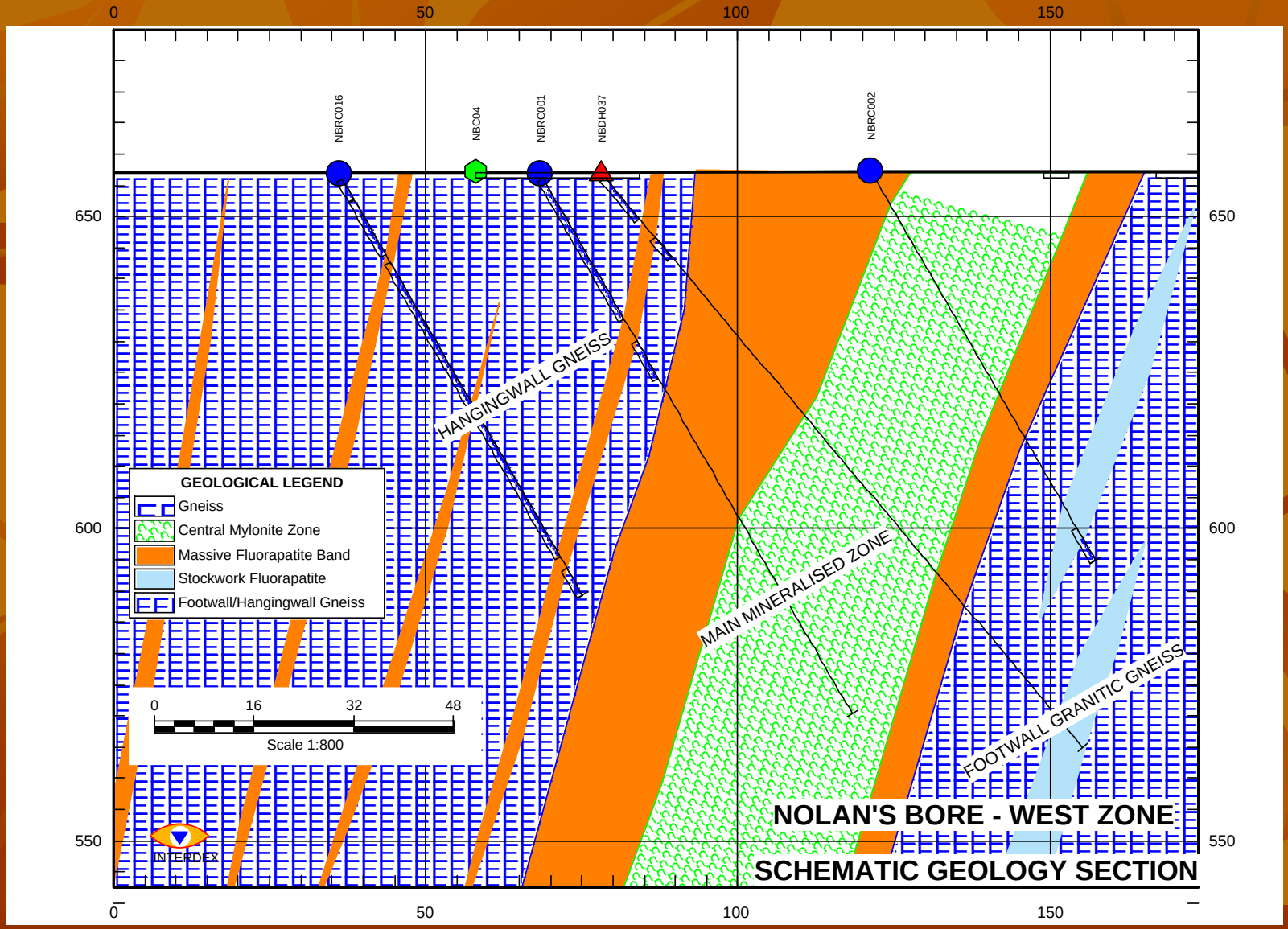


NOLAN'S BORE RESOURCE ZONES AND LOCAL PROSPECTS (View to SW)

NOLAN'S BORE INTERP FAP BANDS



NOLAN'S BORE SCHEMATIC INTERPRETATION NORTH ZONE



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I - EXPLORATION & RESOURCES

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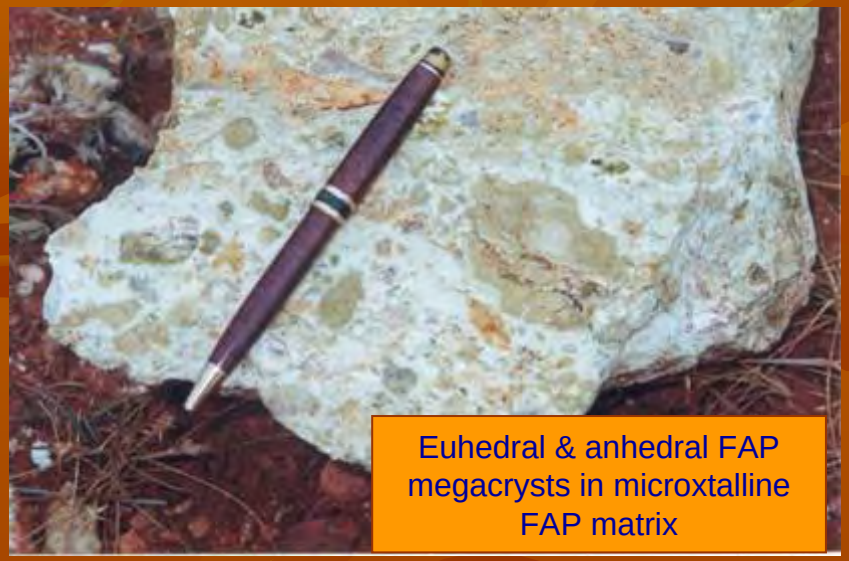
NOLAN'S BORE FLUORAPATITE

Discovery Outcrops

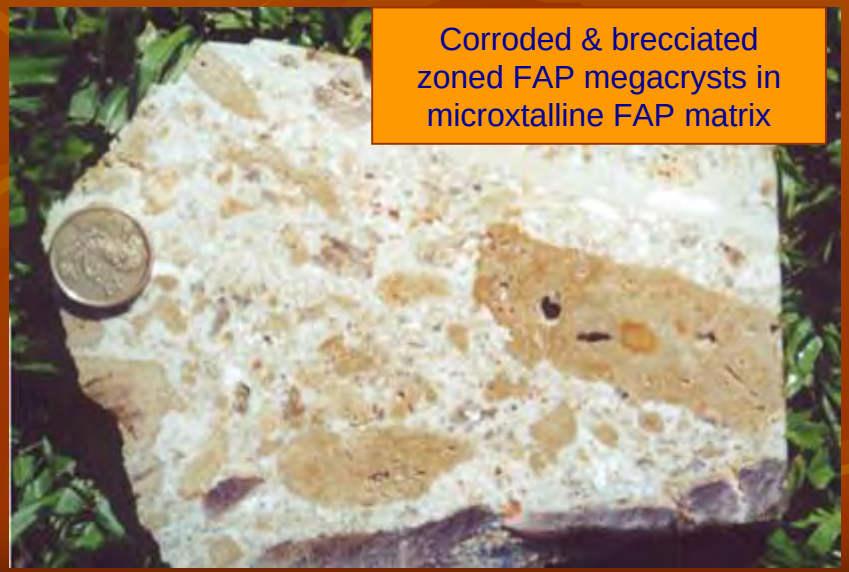
NOLAN'S BORE FLUORAPATITE

Meso-textures I



Euhedral & anhedral FAP megacrysts in microxtalline FAP matrix

Crackle/mosaic brecciated FAP megacrysts in microxtalline FAP matrix



Corroded & brecciated zoned FAP megacrysts in microxtalline FAP matrix

Crackle/mosaic brecciated zoned FAP megacrysts in microxtalline FAP matrix

NOLAN'S BORE FLUORAPATITE

Meso-textures II

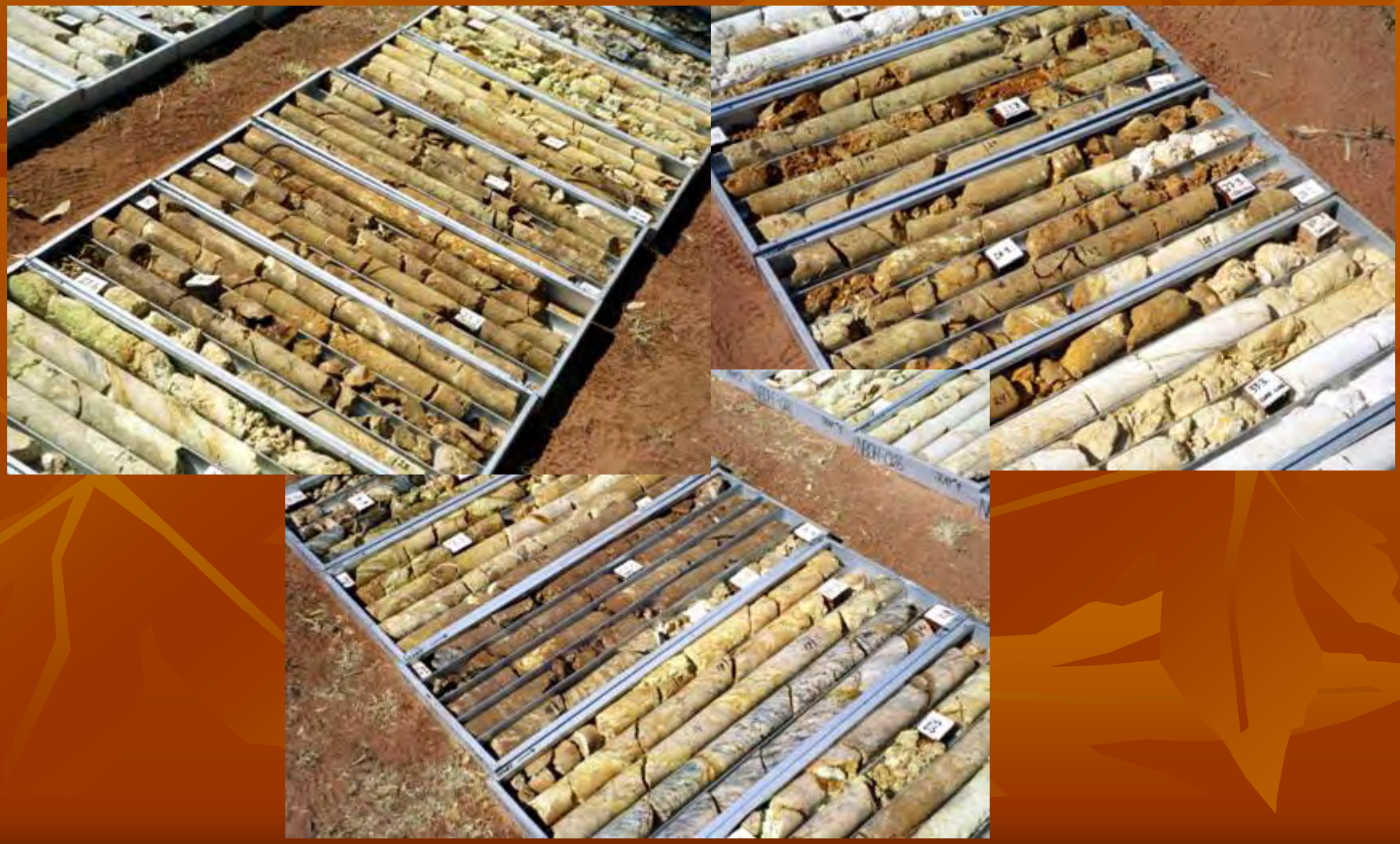
Euhedral & anhedral FAP megacrysts AND unicrystalline breccia clasts in microxtalline FAP matrix

NOLAN'S BORE FLUORAPATITE

Stockwork veins & alteration

NOLANS BORE FLUORAPATITE

Main Mineral Zone - Massive Fluorapatite



NOLANS BORE FLUORAPATITE

Main Mineralised Zone - Mylonite

Stockwork Fluorapatite, Kaolinised Mylonite

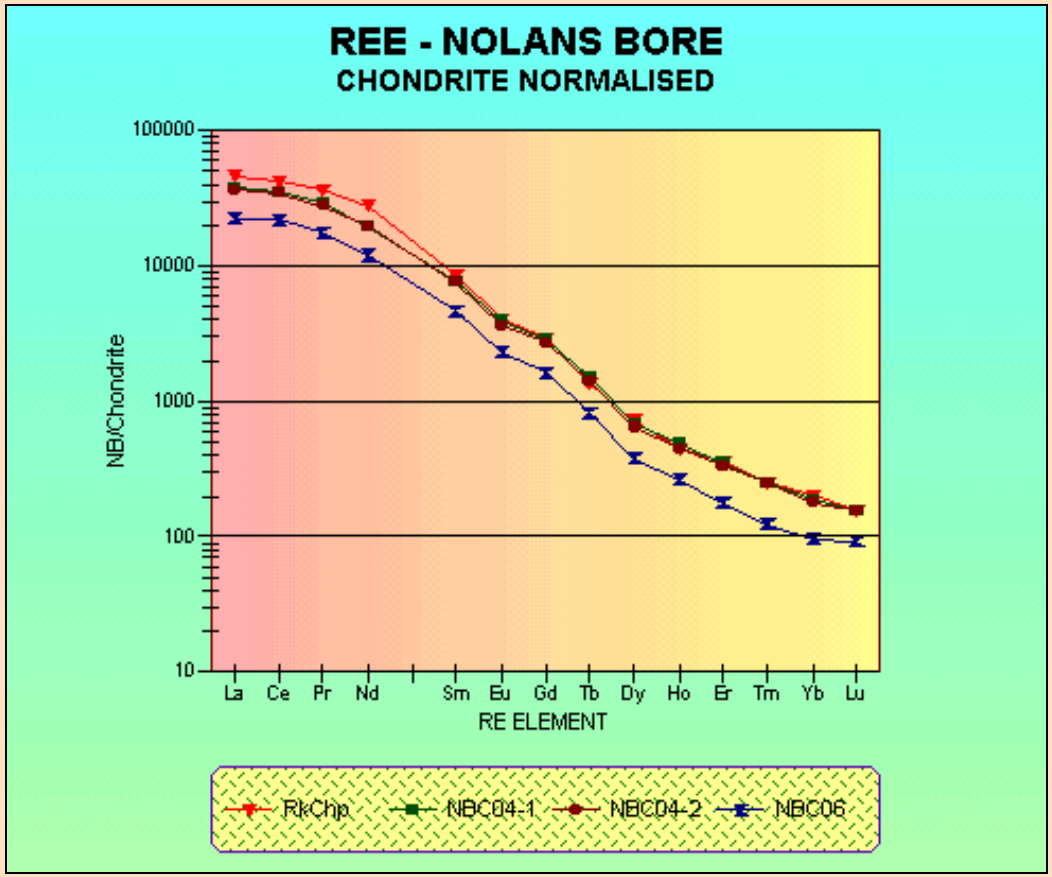
NOLANS BORE FLUORAPATITE

Footwall Gneiss - Stockwork Fluorapatite

NOLANS BORE FLUORAPATITE

Hanging Wall Gneiss - Fluorapatite Bands

NOLANS BORE FLUORAPATITE
LREE Enrichment



RkChp Average of 32 surface rock chip samples, 1999
NBC04-1 Length weighted average 35.1-69.5 metres (34.4 metres) costean NBC04, 2000
NBC04-2 Length weighted average 95-109 metres (14 metres) costean NBC04, 2000
NBC06 Length weighted average 31.8-41 metres (9.2 metres) costean NBC06, 2000

NOLANS BORE FLUORAPATITE
REE Comparisons

COMPARATIVE RARE EARTH CONTENTS OF SELECTED DEPOSITS

(100% REO BASIS)

	NB-Ap %/TotalOx	KHB-Ap %/TotalOx	MP-Bas %/TotalOx	BO-Bas %/TotalOx	WA-Mon %/TotalOx	MW-Mon %/TotalOx
Ce	47.77	45.00	49.10	50.00	46.00	51.00
Dy	0.34	1.10	tr	0.10	0.70	0.20
Er	0.11	0.20	tr	0.20	0.20	0.40
Eu	0.45	0.55	0.10	tr	0.05	0.20
Gd	1.15	2.00	0.20	0.70	1.49	1.00
Ho	0.05	0.10	tr	tr	0.05	0.10
La	19.51	27.00	33.20	23.00	23.90	26.00
Lu	0.01		tr	tr	tr	tr
Nd	20.55	14.50	12.00	18.50	17.40	15.00
Pr	5.98	5.00	4.34	6.20	5.00	4.00
Sm	2.45	1.50	0.80	0.80	2.53	1.80
Tb	0.11	0.15	tr	0.10	0.35	0.10
Tm	0.01		tr	tr	0.04	tr
Yb	0.06	0.10	tr	tr	0.10	0.10
Y	1.45	3.00	0.10	tr	2.40	tr
Sum	100	100	100	100	100	100

Ap - Apatite
Bas - Bastnasite
Mon - Monazite

NB - Nolans Bore
KHB - Khibini, Russia
MP - Mountain Pass, California, USA
BO - Bayan Obo, Inner Mongolia, China
WA - Nth Capel, Western Australia
MW - Mt Weld, Western Asstralia

NOLANS BORE GEOLOGY I

- REE MINERALISATION IS IN TWO DISCRETE ZONES
  - NORTH ZONE 900x350 M
  - SOUTH ZONE 1000x700 METRES
- CENTRAL PART OF DEPOSIT COVERED BY 500 METRE WIDE BELT OF CALCRETE AND ALLUVIUM (PALAEOCHANNEL)
- SWARMS OF FLUORAPATITE BANDS (?VEINS/?DYKES) HOST MOST OF THE REE MINERALISATION IN EACH ZONE
- FLUORAPATITE BANDS ARE 0.5-35 METRES THICK, 10s TO 100s OF METRES LONG & EXTEND >200 METRES BELOW THE SURFACE
- MASSIVE FLUORAPATITE BANDS DIP 60-80 DEGREES NW
- LESSER FLUORAPATITE MINERALISATION OCCURS IN IRREGULAR STOCKWORK VEINS IN MYLONITE ZONE AND FOOTWALL GNEISSIC GRANITE
- HOST ROCKS INCLUDE GNEISSIC GRANITE (MT BOOTHBY ORTHOGNEISS), FELSIC AND MAFIC GNEISS (LANDER ROCK BEDS), GRANITE/PEGMATITE, MYLONITE

NOLANS BORE GEOLOGY II

Mineralisation

- HIGH REE GRADE (7-9% REE) & LOW U GRADE (0.05-0.06% U) CONFIRMED IN ALL FLUORAPATITE BANDS
- FLUORAPATITE IS VERY COARSELY CRYSTALLINE AND BRECCIATED IN MOST, IF NOT ALL, BANDS
- SOME BANDS DISPLAY A ‘PORPHYRITIC’ TEXTURE WITH EUHEDRAL FLUORAPATITE MEGACRYSTS TO 10 CM IN MICROCRYSTALLINE FLUORAPATITE MATRIX
- 25-30% OF REE HOSTED IN FLUORAPATITE, 65-70% BY CHERALITE MICROVEINLETS IN FLUORAPATITE, 5% BY MASSIVE CHERALITE ZONES (?VEINS, SHEARS)
- THE REEs ARE DOMINATED BY Ce La Nd and Pr (LREE ENRICHED) - THESE COMPRISE ABOUT 94% OF TOTAL REE

NOLANS BORE GEOLOGY III
Fluorapatite Relationships

- MASSIVE FLUORAPATITE BANDS DISPLAY SHARP CURVIPLANAR CONTACTS WITH HOST ROCKS
- MASSIVE FLUORAPATITE DYKES DISPLAY NO INTERNAL ZONING AND NO MINERAL ALIGNMENT
- FLUORAPATITE TRANSGRESSES METAMORPHIC FABRIC IN HOST ROCKS - FABRIC DIPS STEEPLY NNE
- STRONGEST FLUORAPATITE DEVELOPMENTS ARE SPATIALLY ASSOCIATED KAOLINISED N-DIPPING MYLONITE ZONE
- FLUORAPATITE VEINS/BANDS TRANSGRESS MYLONITE TREND AND FOLIATION
- FLUORAPATITE MINERALISATION AND ASSOCIATED ALTERATION OCCURS IN LATE GRANITIC PEGMATITES

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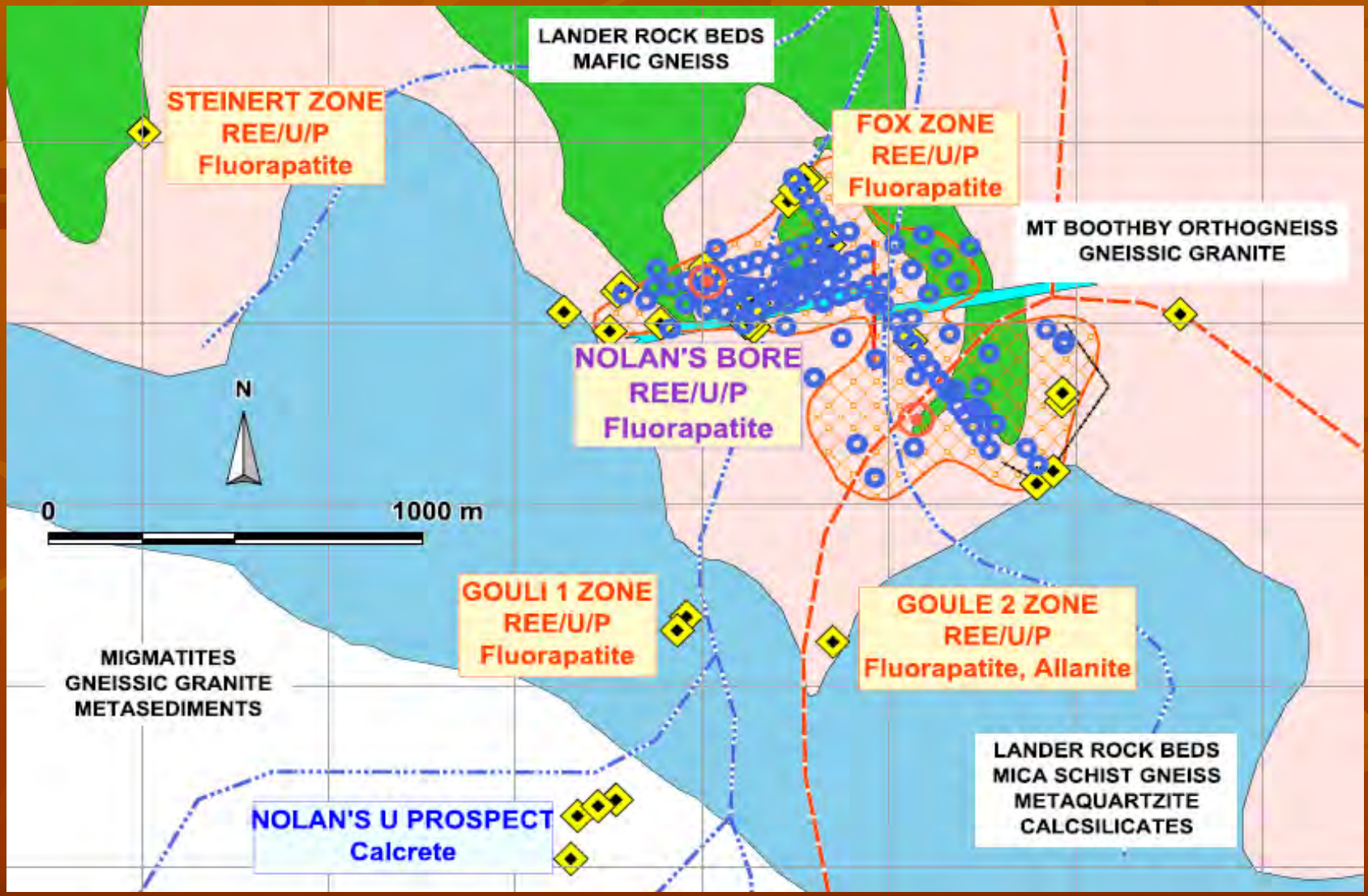
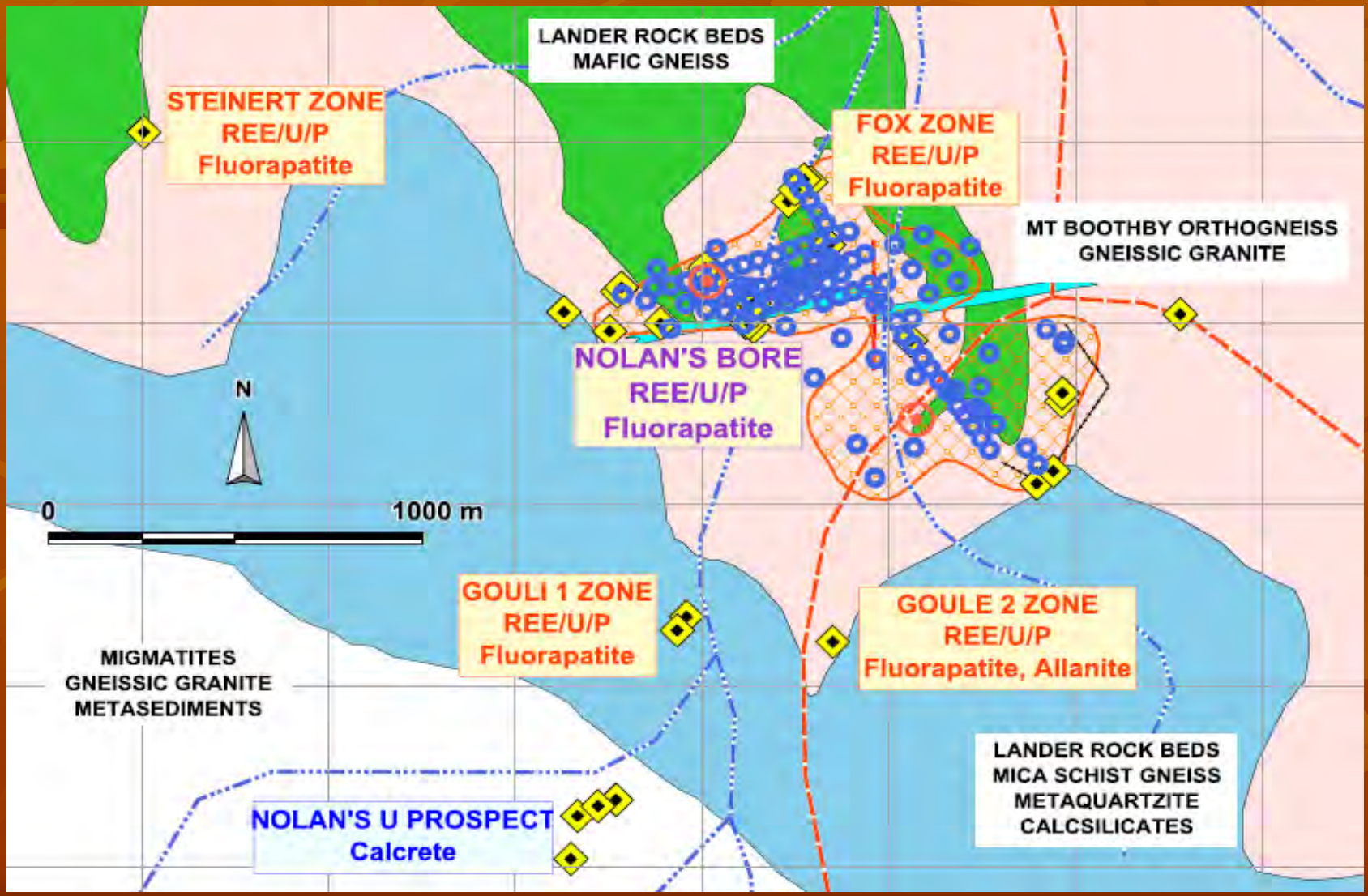
NOLAN'S BORE BASEMENT GEOLOGY AND LOCAL PROSPECTS



NOLANS BORE HOST ROCKS I

Gneissic granite – Mt Boothby Orthogneiss

NOLAN'S BORE BASEMENT GEOLOGY AND LOCAL PROSPECTS

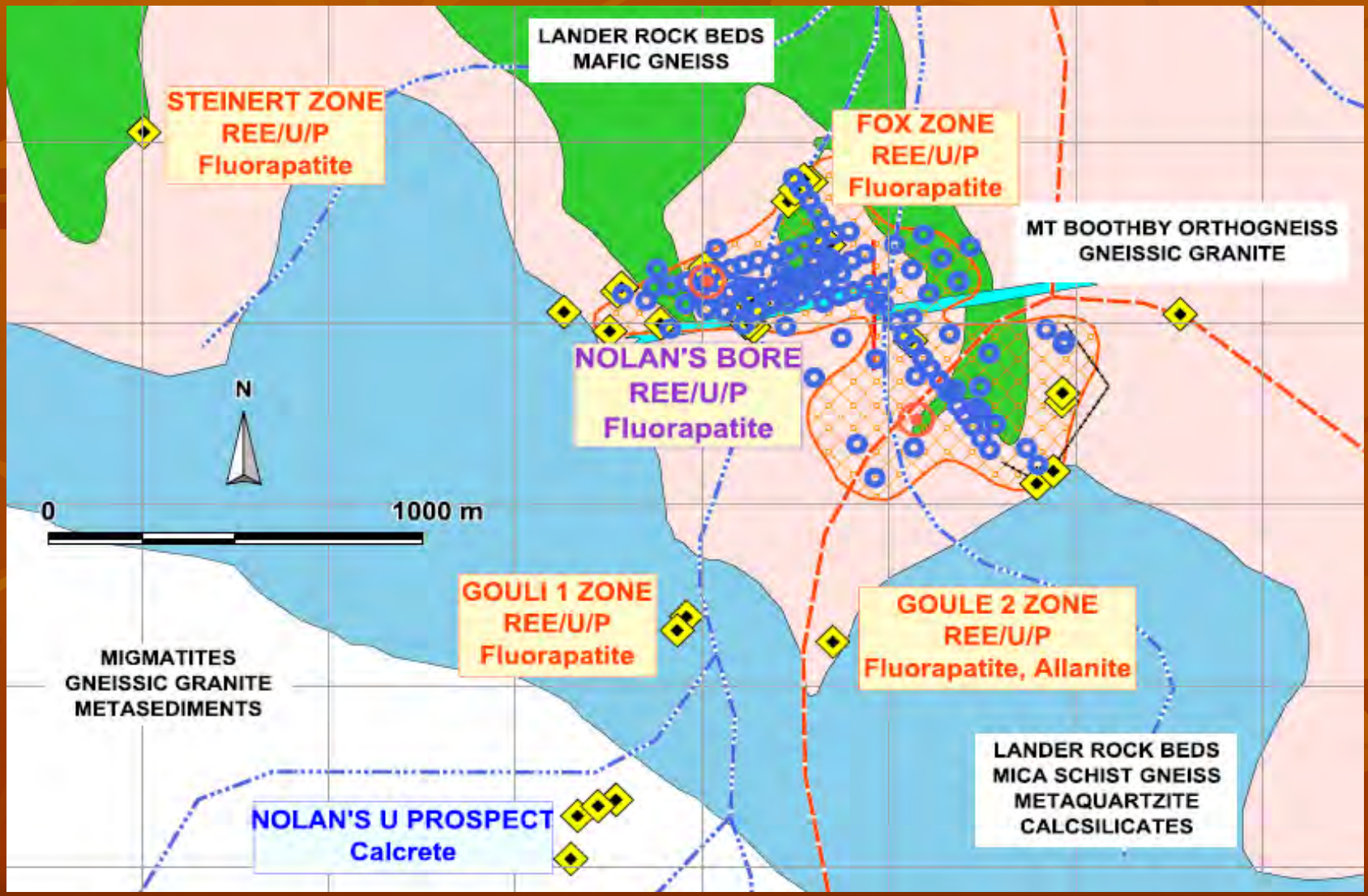


NOLANS BORE HOST ROCKS II

Cordierite-Magnetite Psammopelitic Gneiss

Lander Rock Beds (North)

NOLAN'S BORE BASEMENT GEOLOGY AND LOCAL PROSPECTS

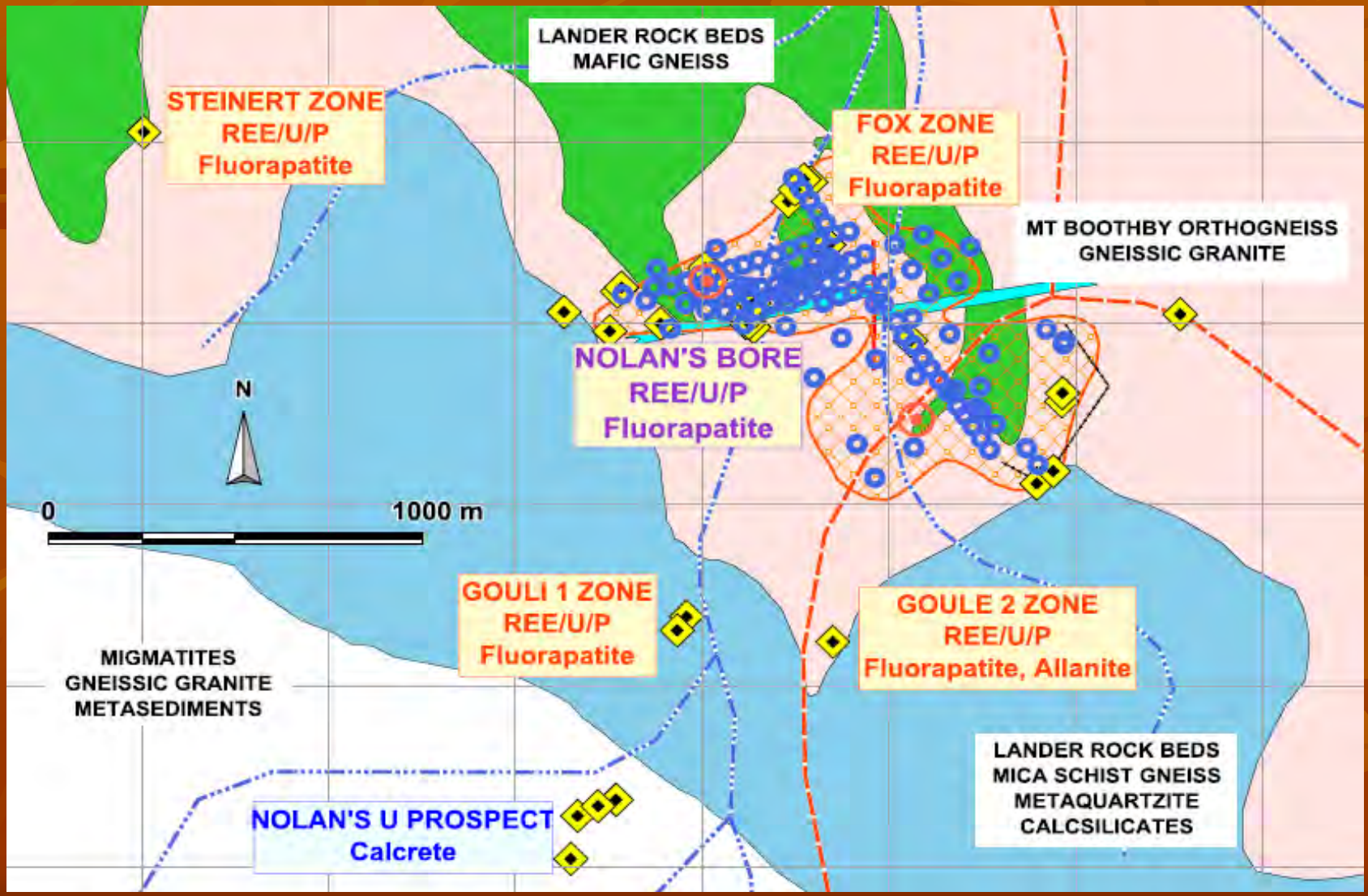


NOLANS BORE HOST ROCKS III

Mica Schist & Gneiss, Quartzite

Lander Rock Beds (South)

NOLAN'S BORE BASEMENT GEOLOGY AND LOCAL PROSPECTS



NOLANS BORE HOST ROCKS IV

Southern Migmatite gneiss – ?Napperby Gneiss

NOLANS BORE HOST ROCKS V

Granitic Pegmatite

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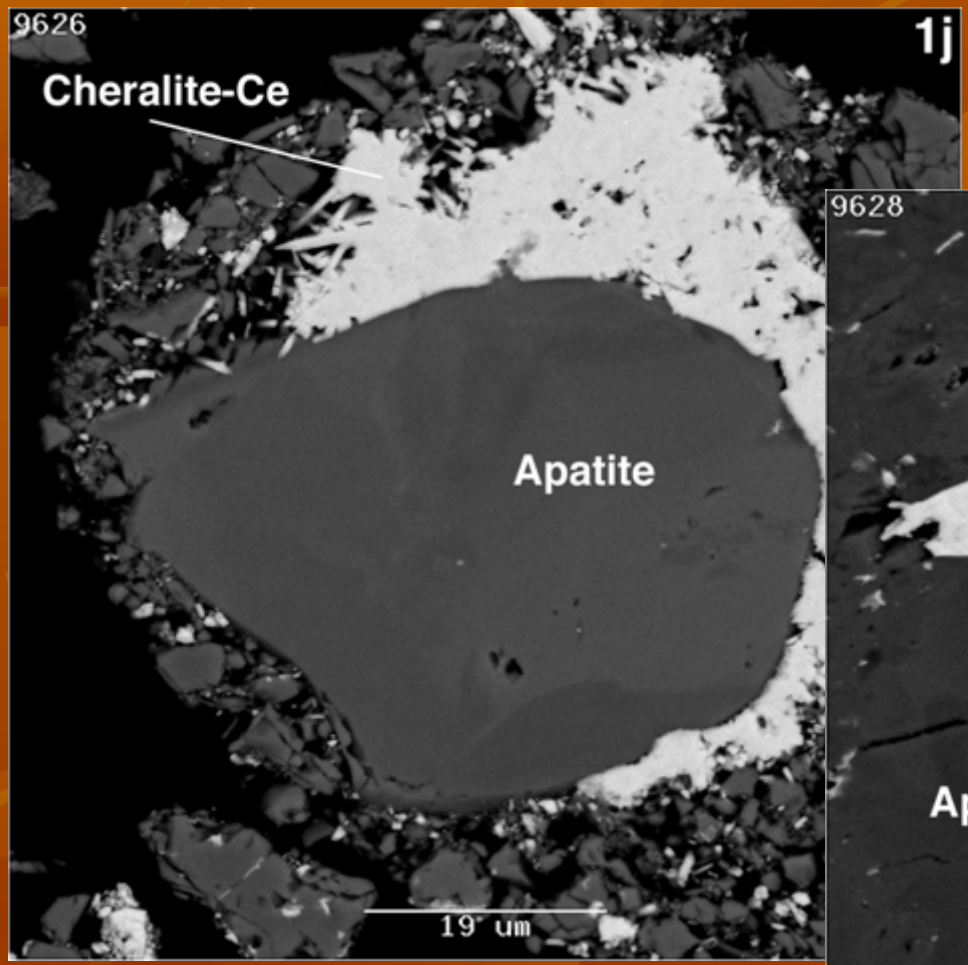
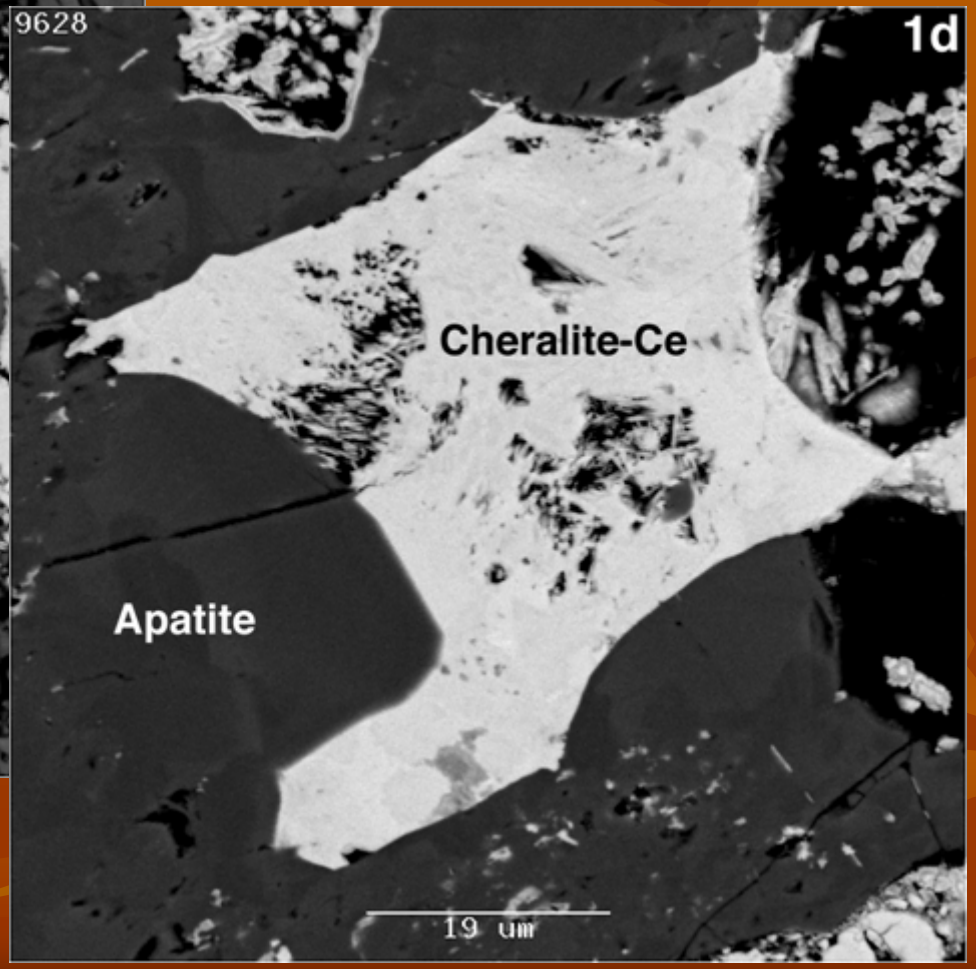
SCANNING ELECTRON MICROSCOPE BACKSCATTER IMAGES

by
RACHAEL TRAUTMAN ANSTO, 2001

NOLAN'S BORE FLUORAPATITE

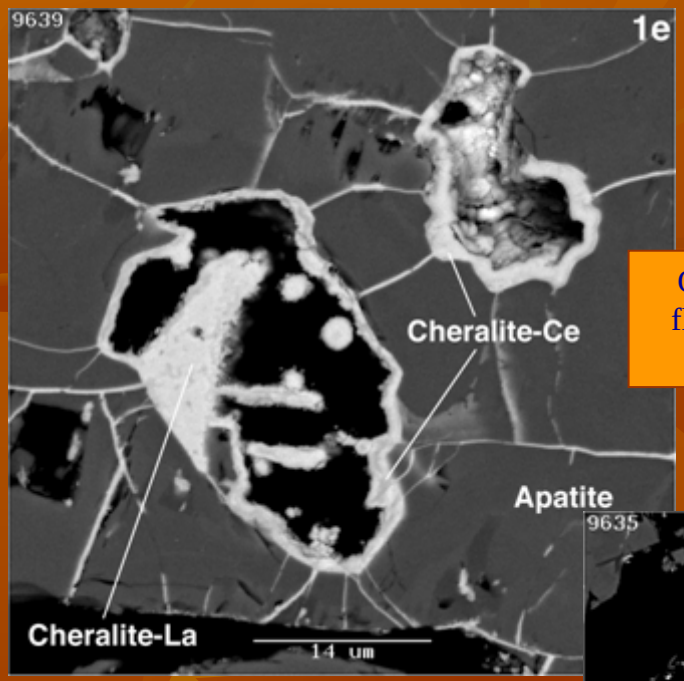
SEM Micro-textures I – Fluorapatite variations



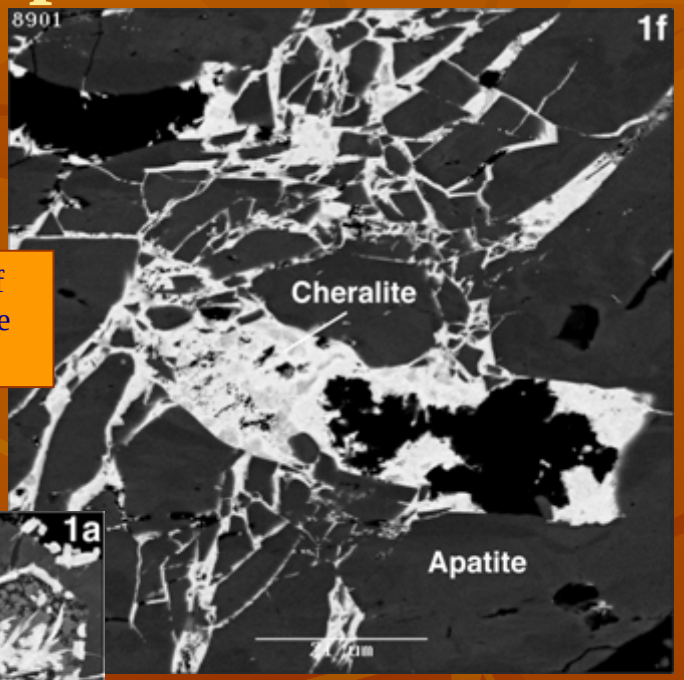


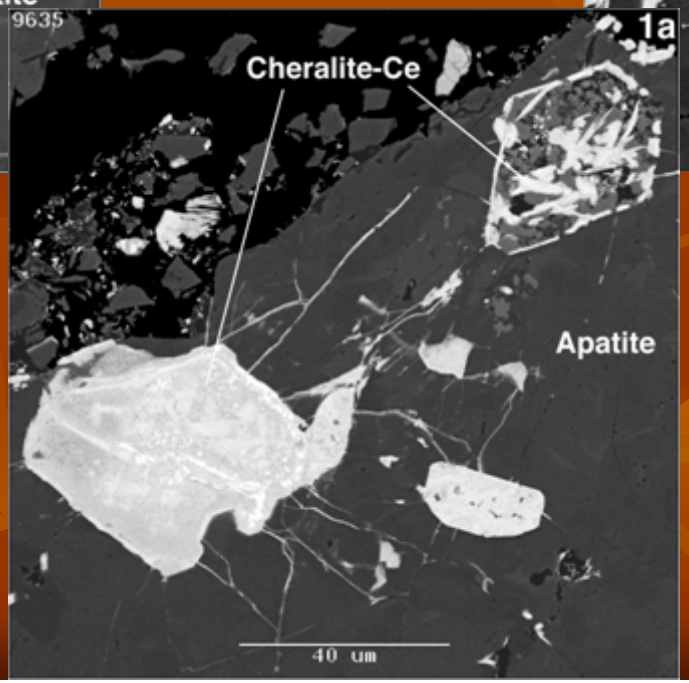
NOLAN'S BORE FLUORAPATITE

SEM Micro-textures II – Fluorapatite Brecciation



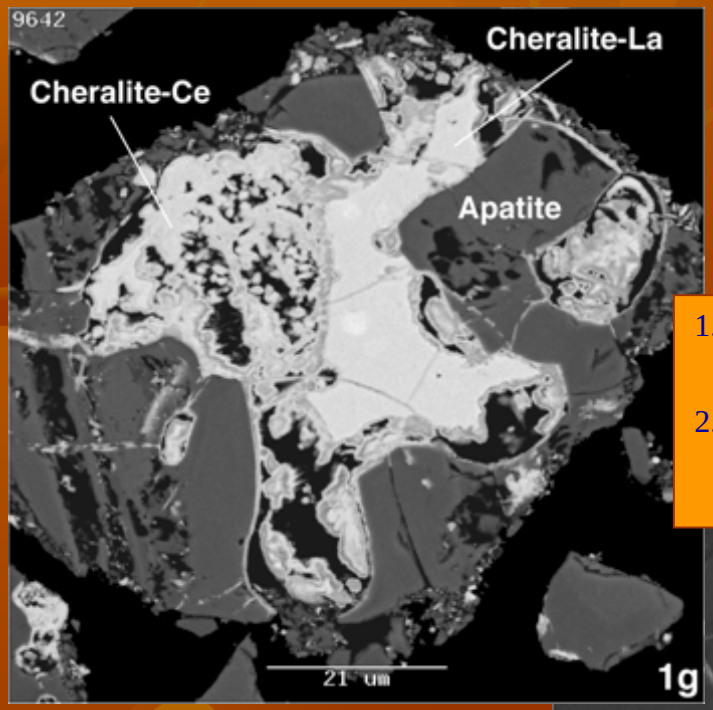
Crackle/mosaic/rubble brecciation of fluorapatite with infill by cheralite-Ce and cheralite-La

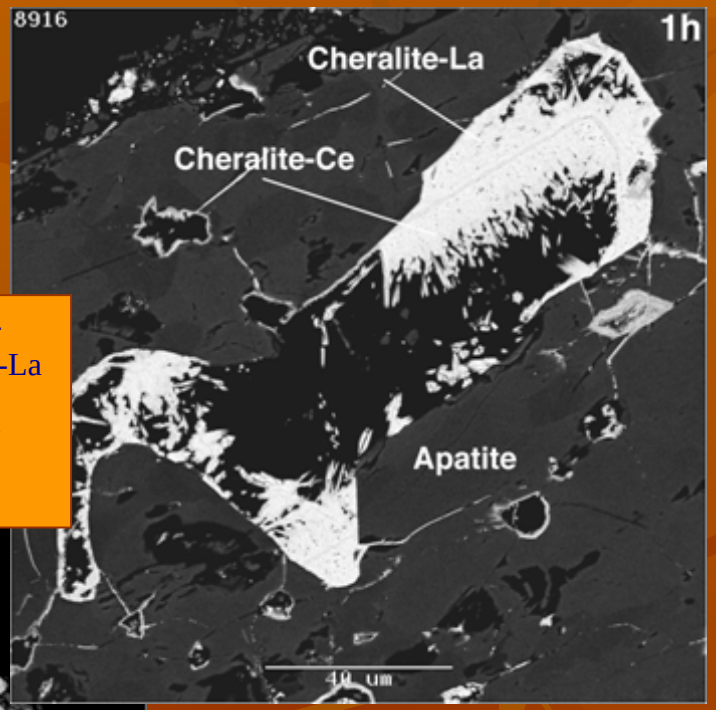




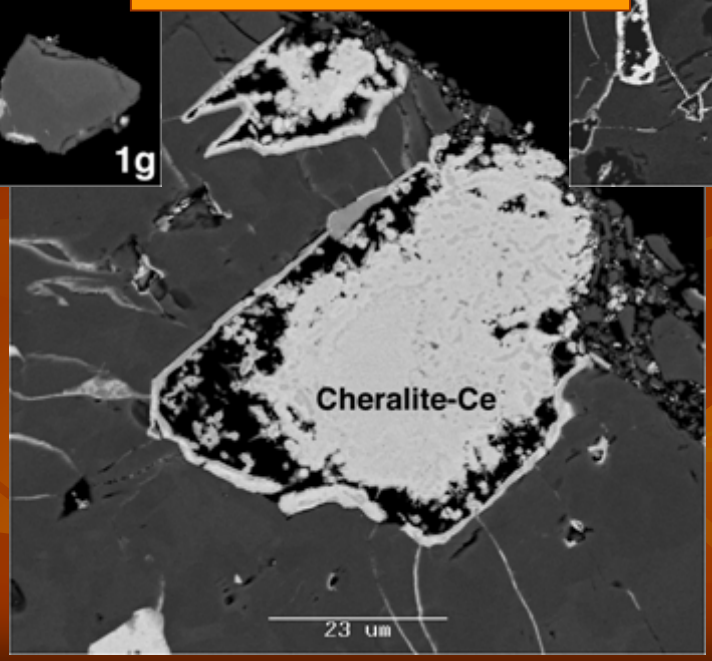
NOLAN'S BORE FLUORAPATITE

SEM Micro-textures III – Cheralite-Ce/La



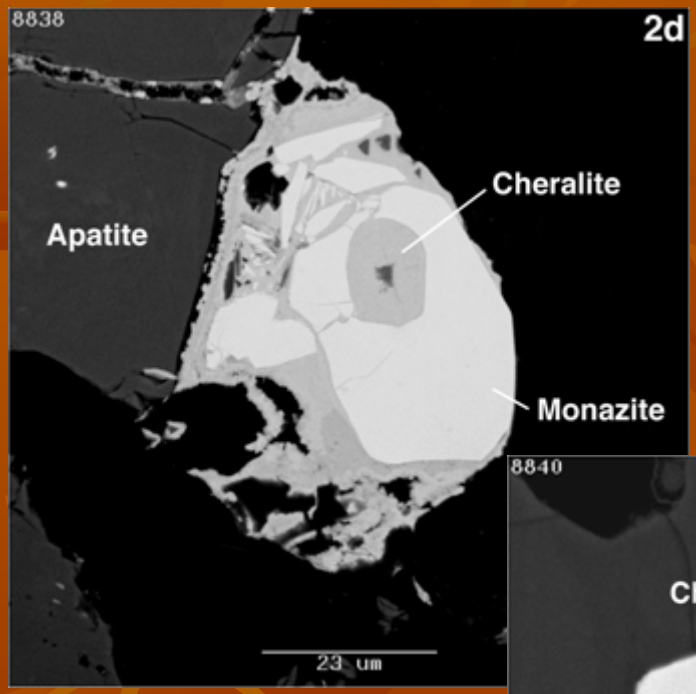


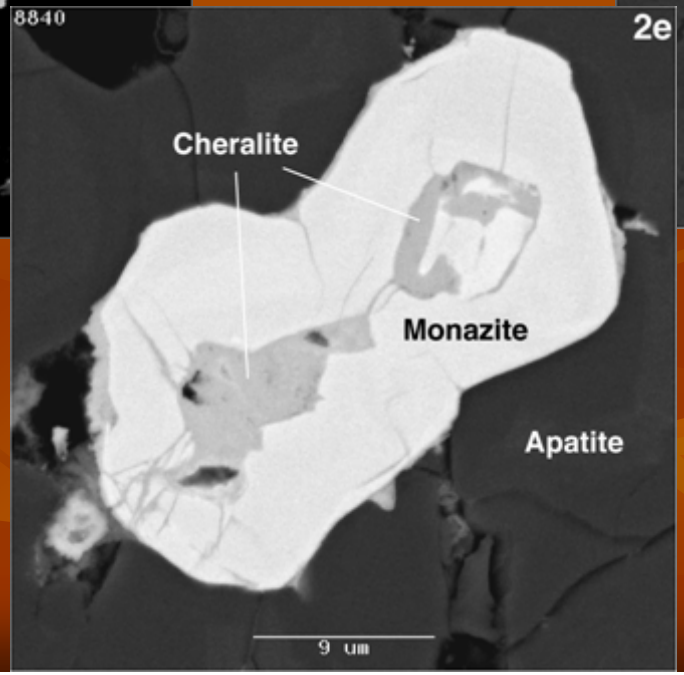
1. Corrosion of fluorapatite - infill by massive cheralite-La
2. Corrosion of cheralite and fluorapatite - infill by colloform cheralite-Ce

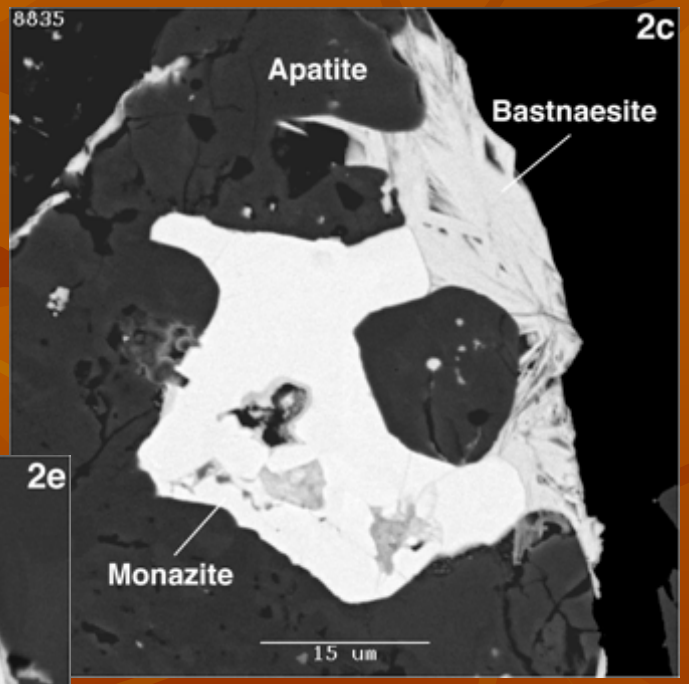


NOLAN'S BORE FLUORAPATITE

SEM Micro-textures IV - Monazite

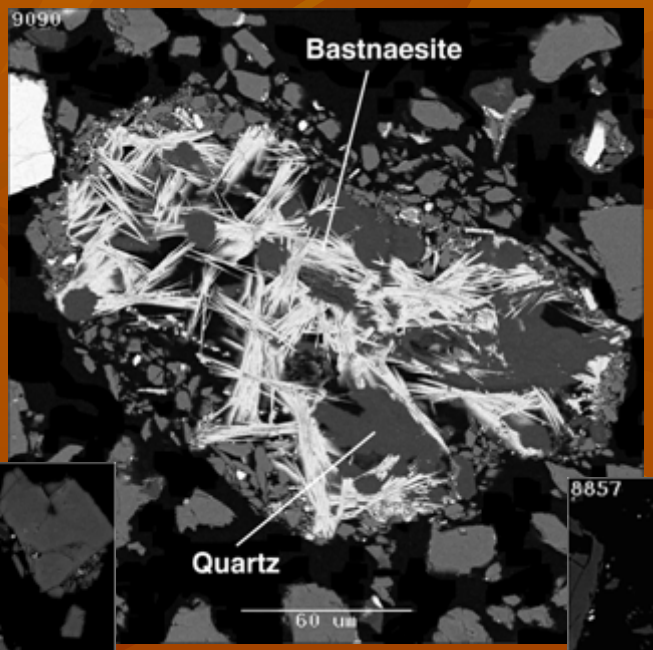


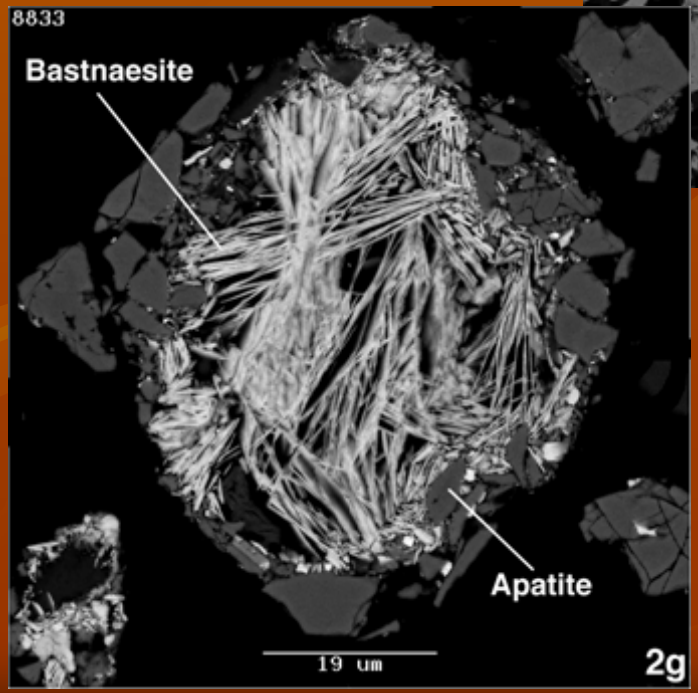




NOLAN'S BORE FLUORAPATITE

SEM Micro-textures V- Bastnaesite





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END