

**NT EXPLORATION LICENCE 6899**

**REPORT OF EXPLORATION ACTIVITIES**

**(21 June 1990 to 20 June 1992)**

**(YEAR TWO)**

**LICENCEES:** DR BURTON MURRELL  
SATURN RESOURCES PTY LTD

**MAP SHEETS:** 1:250,000 ALICE SPRINGS SF 53-14  
1:100,000 LAUGHLEN 5751

**AUTHOR:** Burton Murrell, PhD, FAustIMM, MAIG.

**CR92/478**

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19.06.92

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- 1.** **SUMMARY**

The whole of the exploration Licence area has been covered by stream sediment sampling of the overbank silts for geochemistry of the clay fraction. Results are presented for the 150 stream sediment samples were collected in this program covering about 70% of the Licence area, the remainder being major areas covered by alluvium and catchments below minimum target size.

Field studies have covered the majority of mapped mineral occurrences. The major quartz-filled breccias along the Woolanga Lineament show a coincident low level copper anomaly. Work continues on field checking anomalous photofeatures which could represent diatremes carrying mantle material. Soil samples for geochemistry collected from two enigmatic areas of no outcrop which occur nearby to each other in hilly terrain showed no anomalism.

## 2.

### INTRODUCTION

The Woolanga Lineament and related Pinnacles Fault appear as major crustal fractures juxtaposing blocks of vastly different metamorphic grade and truncating such major features as the Redbank (Harry Creek) Deformed Zone. In 1974 Stockdale Prospecting Ltd recovered a small diamond from the Pinnacles Bore area. The proximity to the Woolanga Lineament of the Mordor Alkali-basic Complex in the southeast and the Mud Tank Carbonatite in the northeast, the magnesian alteration associated with many types of minor mineral occurrences in the region and the persistent association of elevated chromium with mineralized areas combined with the occurrence of a single diamond suggests that the area associated with and marginal to these fracture systems may well host diamond source rocks.

Traditional diamond search has involved the collection of heavy mineral concentrates for the purpose of identifying minerals associated with some of the known diamond source rocks such as kimberlites. In high-grade metamorphic terrains such as this area, metamorphic heavy minerals such as almandine garnet are so abundant that the costs of sorting concentrates in search of a few significant indicator mineral grains becomes prohibitive. In addition, the discovery of abundant diamonds not associated with the traditional indicator minerals in the lamproitic Argyle Pipe in the Kimberley Region in 1979 caused a major revision of the body of knowledge on diamond occurrence which had built up during (and been skewed by) more than one hundred years of successful search for diamonds via the kimberlite indicator minerals.

The geochemical exploration technique which is in use in this program, in addition to identifying those catchments which contain metal anomalies can also indicate rocks of mantle origin by their distinctive metal abundance signatures. The program is thus designed to locate if possible all base and disseminated precious metal targets and any mantle derived rocks which could contain entrained diamond host rocks.

## 3.

### WORK UNDERTAKEN

#### 3.1. Stream sediment sampling

One hundred and fifty samples of overbank silt each representing unique catchments the order between  $0.5\text{km}^2$  and  $5.0\text{km}^2$  were collected which will give a coverage of about 70% of the total area of the Licence leaving only the main drainage lines untested. Positions of the sample sites and the catchments represented are shown on the accompanying plans which have been prepared as overlays to the BMR 1:25,000 scale geological compilation sheets. In addition to the overbank material from which the clay fraction

is sent for analysis following separation, natural heavy mineral concentrates were collected and added to the sample for preparation of pan concentrates. These are examined for free gold in the pan and splits are examined microscopically.

### 3.2. Field examination

Visits have been made to all except three (so far) of marked occurrences of old workings in and near to the Licence area. The late quartz vein associated occurrences of copper minerals in the Pinnacles Copper District are not themselves considered viable targets but are of interest as indicating sources of mineralizing fluids as all are reputed to have carried some gold in addition to copper.

Of major significance are the extensive quartz-filled breccia zones which occur within the Woolanga Lineament and form the "Pinnacles" in the Pinnacles Fault Zone. Wide spread colluvial quartz along the Lineament suggests that the upstanding quartz-filled breccias are not the only potential host dilatationary breccia zones along these structures. The whole Woolanga Lineament zone is a low level copper anomaly with some sniffs of gold, and the follow-up effort will concentrate in generating drilling targets within this zone.

About half of the photofeatures marked up during the program planning phase of photointerpretation as possible pipes in excess of 100m in diameter have been visited; the remainder will be checked in Year Two. Major features north of Ten Mile Dam which could be a large and a small pipe nearby to each other are quite enigmatic having no outcropping rock within them. The smaller of the two features has a number of types of trees growing on it which are not growing on the adjacent rock types suggesting a different chemistry. Soil samples (615 & 616) were collected for chemistry but unfortunately nothing in the chemistry suggests that these anomalies host mineralization or diatremes. The nearby "Queen of Sheba" prospect has minor copper mineralization in an ultrabasic intrusive of small size.

An effort will be made to locate and assess the source of base metal anomalies which fall in groups of contiguous catchments.

## 4. YEAR THREE PROGRAM

### 4.1. ACTIVITIES

Follow-up of the anomalies expected from the regional stream sediment geochemistry will be in two phases;

1. Prospecting of the catchment to see if the source of the anomalous signal can be located directly by inspection thus circumventing the slow and costly sub-sampling to closer locate the source of the anomalous signal. Any potential bodies found will be gridded and sampled to

locate drilling targets. Promising prospects generated will be put forward for drilling in Year Three.

2. Where no apparent source for the geochemical anomaly is found by prospecting, the catchment will be resampled and up to six subsamples collected representing major segments of the original catchment. These will represent subcatchments up to but rarely exceeding 1 km<sup>2</sup> in area which will closer identify the source of the anomaly but not add too greatly to costs should the original anomalous value not be able to be repeated by the laboratory (eg. due to laboratory error or contamination of the original sample).

The Year Three Program is designed to fully test the area remaining under licence. The adjacent area which could host the source of the diamond recovered by Stockdale has also been applied for now that it has become available so that it may also be tested by extending this program.

#### 4.2 EXPENDITURE

The minimum cost of the Year Three program, should no actual prospects be located during follow-up is estimated to cost \$12,500 which figure is proposed for consideration as the Year Three covenant.

#### 5.

#### EXPENDITURE

Manning	6,000
Vehicle 15 days @ \$75	1,125
Fuel & supplies for field work	925
Consumables	69
Freight	96
Analysis 150 @ \$22	3,300
Office apportioned	1,200
	<hr/>
	TOTAL
	\$12,715

#### 6.

#### LIST OF PLANS

LAUGHLEN 1:25,000, Stream sediment sample sites and catchments represented (plotted as overlays to the BMR Geol. compilation sheets).

Maps 5/16, 6/16, 7/16, 9/16, 10/16, 11/16 & 12/16 (7 maps, no map area completely covered).

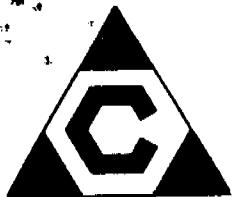
#### 7.

#### KEY WORDS

7.

**KEY WORDS**

**Strangways Range, Pinnacles Copper District, copper, gold, diamond,  
geochemistry (stream sediment) (overbank silts, clay fraction).**



# CLASSIC LABORATORIES

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Dr B. Murrell  
P.O. Box 3777  
ALICE SPRINGS

NT 0871

**ANALYSIS REPORT :**

Your Reference : 95

Our Reference : 2DN0055

Samples Received : 21/01/92  
Number of Samples : 229

Results Reported : 05/02/92  
Report Pages : 1 to 5

This report relates specifically to the samples tested in so far as the samples supplied are truly representative of the sample source.

If you have any enquiries please contact the undersigned quoting our reference as above.

**Report Codes:**

N.A. -Not Analysed

L.N.R. -Listed But Not Received

I.S. -Insufficient Sample

Approved Signature:

for

ALAN CIPLYS  
Manager - Darwin  
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Final

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Job: 2DN0055  
O/N: 95

## ANALYTICAL REPORT

SAMPLE	Au	AuDpl	Cu	Pb	Zn
14501	0.002	--	64	10	140
14502	0.001	<0.001	54	11	170
14503	<0.001	--	66	20	185
14504	<0.001	--	48	14	120
14505	<0.001	--	52	17	135
14506A	0.001	--	48	17	220
14506B	0.002	--	43	16	500
14507	0.003	--	44	19	195
14508	0.006	--	41	17	350
14509	0.002	--	39	13	185
14510	0.002	--	49	17	185
14511	0.001	--	37	13	190
14512	0.001	--	22	11	240
14513	<0.001	--	29	13	210
14514	0.001	--	26	15	220
14515	<0.001	--	46	17	360
14516	0.002	--	53	16	480
14517	<0.001	--	53	13	200
14518	0.001	--	50	16	340
14519	<0.001	--	48	14	400
14520	<0.001	--	49	17	430
14521	<0.001	--	60	17	200
14522	<0.001	--	59	12	390
14523	<0.001	--	50	12	140
14524	0.001	--	45	13	130
14525	<0.001	--	49	16	135
14526	<0.001	<0.001	53	16	145
14527	0.002	--	44	13	230
14528	0.001	0.001	43	12	150
14529	<0.001	--	62	13	155
14530	<0.001	--	61	12	195
14531	0.001	--	55	16	210
14532	<0.001	--	45	16	210
14533	<0.001	--	56	15	370
14534	<0.001	--	47	16	170
14535	<0.001	--	30	18	185
14536	<0.001	--	61	19	400
14537	<0.001	--	61	21	250
14538	<0.001	--	60	21	520
14539	0.002	--	73	17	360
14540	0.003	--	54	15	460
14541	0.002	--	51	16	290
14542	0.002	--	49	15	390
14543	0.003	0.002	43	13	230
14544	0.001	--	53	16	200
14545	0.002	--	56	12	165
14546	0.002	--	36	25	450
14547	0.003	--	38	15	430
14548	0.003	--	48	14	430
14549	0.003	0.001	44	17	460
UNITS	ppm	ppm	ppm	ppm	ppm
DET.LIM	0.001	0.001	2	4	2
SCHEME	AAS9	AAS9	AAS9	AAS9	AAS9



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## ANALYTICAL REPORT

SAMPLE	Au	AuDpl	Cu	Pb	Zn
14550	0.002	--	34	12	220
14551	0.002	--	12	13	135
14552	0.002	--	28	13	150
14553	0.002	--	35	15	140
14554	0.002	--	51	12	150
14555	0.002	--	43	13	160
14556	0.002	--	82	22	195
14557	0.001	--	53	14	150
14558	0.002	--	49	14	200
14559	0.002	--	53	16	170
14560	0.002	--	49	21	350
14561	0.002	--	47	26	430
14562	0.002	--	41	17	390
14563	0.002	--	70	15	200
14564	0.002	--	62	16	170
14565	0.001	--	64	17	145
14566	0.002	0.002	55	23	230
14567	0.002	--	56	19	190
14568	0.002	--	49	19	210
14569	0.003	0.002	41	14	165
14570	0.001	--	44	15	230
14571	0.002	--	45	14	210
14572	<0.001	--	43	15	180
14573	0.002	0.002	37	16	185
14574	0.002	--	49	16	340
14575	0.001	--	45	14	165
14576	0.002	--	44	18	210
14577	0.002	--	87	17	370
14578	0.002	--	53	21	230
14579	0.001	--	44	14	210
14580	0.002	--	49	14	210
14581	0.001	--	52	21	230
14582	0.002	--	55	17	210
14583	0.003	--	61	14	210
14584	0.001	--	56	14	210
14585	0.001	--	59	18	280
14586	0.004	0.003	63	14	220
14587	0.002	--	62	18	180
14588	0.002	--	56	15	185
14589	0.002	--	51	11	145
14590	0.002	--	60	23	230
14591	0.001	--	64	12	145
14592	0.002	--	65	26	240
14593	0.001	--	60	12	165
14594	0.001	--	54	13	150
14595	0.001	--	44	12	155
14596	<0.001	--	39	15	190
14597	0.001	--	39	13	165
14598	0.003	--	46	12	220
14599	0.001	--	51	31	210

UNITS	ppm	ppm	ppm	ppm	ppm
DET.LIM	0.001	0.001	2	4	2
SCHEME	AAS9	AAS9	AAS9	AAS9	AAS9



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Job: 2DN0055  
O/N: 95

## ANALYTICAL REPORT

SAMPLE	Au	AuDpl	Cu	Pb	Zn
14600	<0.001	--	43	19	165
14601	0.001	--	50	13	220
14602	0.002	--	55	18	135
14603	0.002	--	47	20	180
14604	0.002	0.002	48	11	130
14605	0.001	--	73	13	135
14606	0.001	--	47	13	115
14607	0.001	--	47	12	120
14608	0.002	--	47	13	170
14609	0.003	--	54	13	210
14610	0.001	0.001	54	13	200
14611	0.002	--	37	13	210
14612	0.001	--	77	9	135
14613	0.002	--	35	6	170
14614	0.001	--	65	13	180
14615	0.002	--	32	9	165
14616	0.002	--	49	14	155
14617	0.002	--	55	14	155
14618	0.003	--	39	24	380
14619	0.004	--	57	17	230
14620	<0.001	--	74	11	150
14621	<0.001	--	61	9	230
14622	<0.001	0.001	49	8	185
14623	<0.001	--	43	7	135
14624	0.001	--	51	12	185
14625	0.003	--	50	7	165
14626	0.001	--	36	11	140
14627	<0.001	--	50	9	160
14628	0.003	--	42	10	135
14629	<0.001	--	54	7	85
14630	0.001	--	48	8	87
14631	0.002	--	45	7	220
14632	0.001	--	43	11	130
14633	0.001	--	46	8	210
14634	0.001	--	39	10	120
14635	0.001	--	57	18	125
14636	0.001	--	49	21	150
14637	<0.001	--	49	16	82
14638	<0.001	--	31	21	165
14639	<0.001	--	25	20	440
14640	0.001	--	34	24	300
14641	0.001	--	40	21	165
14642	<0.001	<0.001	43	19	140
14643	<0.001	--	44	24	180
14644	<0.001	--	45	25	230
14645	<0.001	<0.001	31	20	360
14646	<0.001	--	17	11	125
14647	<0.001	--	40	17	430
14648	<0.001	--	43	22	380
14649	<0.001	--	45	18	380

UNITS	ppm	ppm	ppm	ppm	ppm
DET.LIM	0.001	0.001	2	4	2
SCHEME	AAS9	AAS9	AAS9	AAS9	AAS9



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Job: 2DN0055  
O/N: 95

## ANALYTICAL REPORT

SAMPLE	Au	AuDpl	Cu	Pb	Zn
14650	0.001	--	41	23	450
14651	0.001	--	37	19	135
14652	0.002	--	44	19	170
14653	<0.001	<0.001	32	18	185
14654	0.002	--	73	40	370
14655	0.002	--	53	29	580
14656	<0.001	--	57	18	150
14657	0.001	--	67	16	140
14658	0.001	--	55	17	145
14659	0.002	--	50	18	165
14660	0.001	--	56	20	175
14661	0.002	--	48	19	135
14662	0.001	--	38	18	115
14663	0.002	--	43	31	190
14664	<0.001	--	57	20	145
14665	0.001	--	46	18	160
14666	0.001	--	45	16	210
14667	0.002	--	74	24	200
14668	<0.001	--	55	17	165
14669	<0.001	--	38	18	130
14670	0.001	0.002	52	17	145
14671	0.001	<0.001	43	21	175
14672	<0.001	--	42	14	190
14673	<0.001	--	71	28	380
14674	<0.001	0.002	40	23	175
14675	<0.001	--	38	19	200
14676	0.004	--	42	17	170
14677	0.003	--	45	32	220
14678	0.001	--	42	24	310
14679	0.002	--	42	25	170
14680	0.003	--	33	24	210
14681	0.002	--	20	17	155
14682	0.001	--	28	18	145
14683	0.002	--	49	13	210
14684	0.002	--	30	17	330
14685	0.001	--	32	18	240
14686	0.001	--	27	17	145
14687	0.002	--	46	15	170
14688	0.001	--	50	15	175
14689	0.002	--	39	12	150
14690	0.002	--	51	16	200
14691	0.002	--	40	13	135
14692	0.002	--	40	9	120
14693	0.003	--	54	19	165
14694	0.002	--	36	13	140
14695	0.003	--	35	12	190
14696	0.001	--	42	13	165
14697	0.002	--	50	12	155
14698	0.002	--	62	9	160
14699	0.001	--	39	11	165

UNITS	ppm	ppm	ppm	ppm	ppm
DET.LIM	0.001	0.001	2	4	2
SCHEME	AAS9	AAS9	AAS9	AAS9	AAS9



CLASSIC LABORATORIES

Final

Job: 2DN0055  
O/N: 95

## ANALYTICAL REPORT

SAMPLE	Au	AuDpl	Cu	Pb	Zn
14700	0.001	--	39	13	170
14701	0.002	--	50	13	185
14702	0.001	--	55	13	230
14703	0.003	--	55	9	230
14704	0.001	--	50	6	135
14705	0.003	--	41	10	140
14706	0.002	--	33	8	150
14707	0.003	--	29	12	160
14708	0.001	--	39	10	165
14709	0.002	--	36	6	165
14710	0.001	--	42	6	130
14711	<0.001	--	31	5	170
14712	0.003	--	51	12	430
14713	0.002	--	48	16	200
14714	0.002	--	41	39	430
14715	0.003	0.002	65	13	330
14716	<0.001	--	45	10	450
14717	0.002	--	36	10	380
14718	0.001	--	58	9	145
14719	0.001	--	50	11	220
14720	0.002	--	64	12	220
14721	0.002	--	50	11	165
14722	0.001	--	49	9	550
14723	0.002	--	29	11	410
14724	0.002	--	93	12	450
14725	<0.001	--	52	9	170
14726	0.003	--	36	9	185
14727	0.002	0.002	56	10	175
14728	0.002	--	88	17	210

UNITS	ppm	ppm	ppm	ppm	ppm
DET.LIM	0.001	0.001	2	4	2
SCHEME	AAS9	AAS9	AAS9	AAS9	AAS9















ACME ANALYTICAL

## Burton Murrell FILE # 92-0118

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ACME ANALYTICAL

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	T %	B ppm	Al %	Na %	K %	Li ppm
14717	1	42	12	301	.1	27	16	717	3.65	2	5	ND	4	110	.2	2	2	43	3.67	.101	30	40	1.09	171	.08	14	4.37	.05	1.02	1
14718	1	70	18	179	.1	39	21	918	4.59	2	5	ND	10	61	.2	2	2	50	1.25	.081	35	51	1.34	188	.12	7	5.15	.05	1.21	1
14719	1	55	20	288	.2	33	18	769	4.89	3	5	ND	10	77	.2	2	2	52	1.53	.055	31	53	1.57	154	.15	31	4.66	.46	1.45	1
14720	1	74	20	289	.2	37	21	1002	4.53	2	5	ND	10	64	.2	2	2	50	1.43	.098	35	46	1.24	200	.11	9	4.88	.04	1.14	1
14721	1	56	16	228	.1	25	16	676	4.13	4	5	ND	9	75	.2	2	2	44	2.75	.108	39	40	1.10	163	.07	11	4.83	.04	1.18	1
14722	1	60	15	351	.1	25	16	531	3.50	2	5	ND	6	120	.2	2	2	40	3.03	.084	37	35	1.16	165	.09	14	4.76	.05	1.08	1
14723	1	53	14	296	.1	31	18	707	3.97	4	5	ND	6	116	.2	2	2	47	2.53	.068	32	41	1.18	174	.10	12	4.48	.04	.97	1
14724	1	128	21	377	.1	40	26	1104	4.46	4	5	ND	5	71	.4	2	2	52	1.34	.072	27	51	1.16	183	.08	9	4.44	.02	.91	1
14725	1	53	10	202	.1	29	17	551	3.26	2	5	ND	6	60	.2	2	2	41	1.74	.064	24	37	1.28	147	.12	11	4.04	.03	1.04	1
14726	1	36	14	228	.1	23	14	473	2.79	2	5	ND	5	137	.2	2	2	35	4.65	.089	27	31	1.27	127	.08	11	3.52	.02	.86	1
14727	1	63	13	206	.1	32	19	644	3.51	3	5	ND	5	61	.2	2	2	45	2.85	.056	31	36	1.39	174	.14	7	4.33	.03	1.20	1
14728	1	103	22	269	.1	35	25	1379	4.85	5	5	ND	9	60	.2	2	2	47	4.66	.066	37	39	.87	109	.04	10	2.77	.01	.77	1
RE 14720	1	73	19	291	.1	35	22	1046	4.53	6	5	ND	9	63	.2	2	2	49	1.42	.101	36	44	1.21	201	.10	6	4.90	.03	1.15	1
STANDARD C	19	58	38	137	7.2	72	34	1057	4.04	43	20	8	39	52	18.8	15	18	57	.49	.089	39	56	.89	176	.09	31	1.89	.06	.15	13

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

134°00'  
134°30'

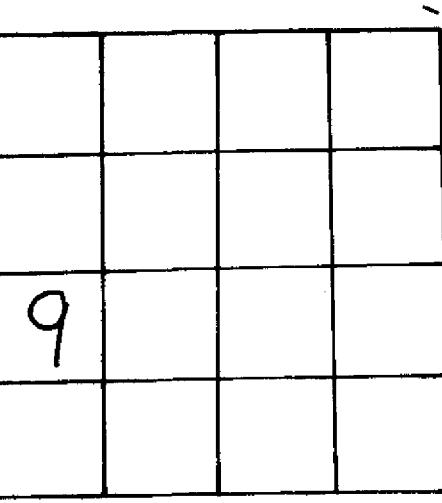
LAUGHLEN  
1:25,000 APPROX

MURRELL & SATURN

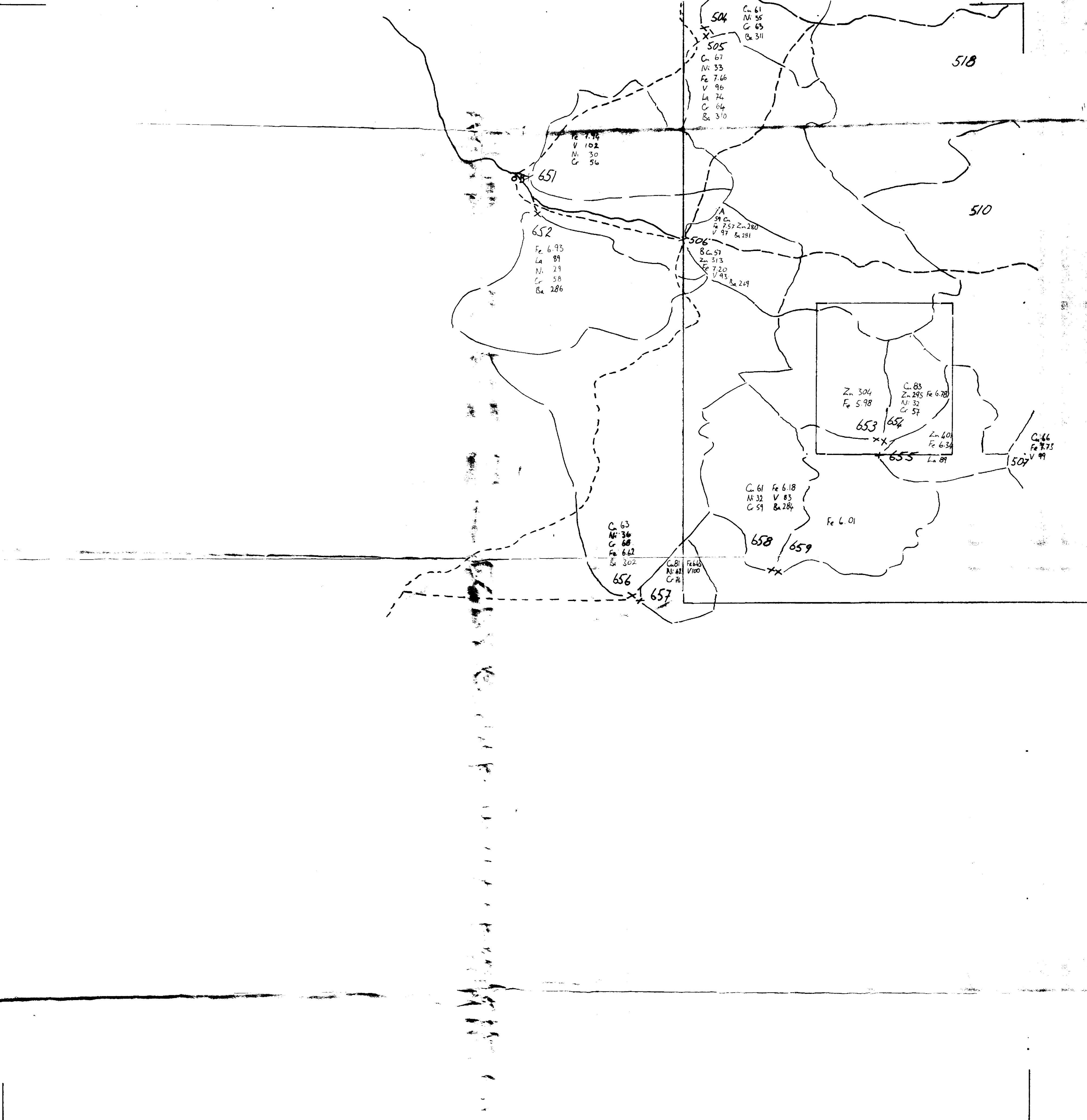
EL 6899

SAMPLE LOCATIONS

Geol. Burton Murrell 19.06.91



25°00'  
25°30'



1/34° 00'  
1/34° 30'  
25° 00'  
25° 30'

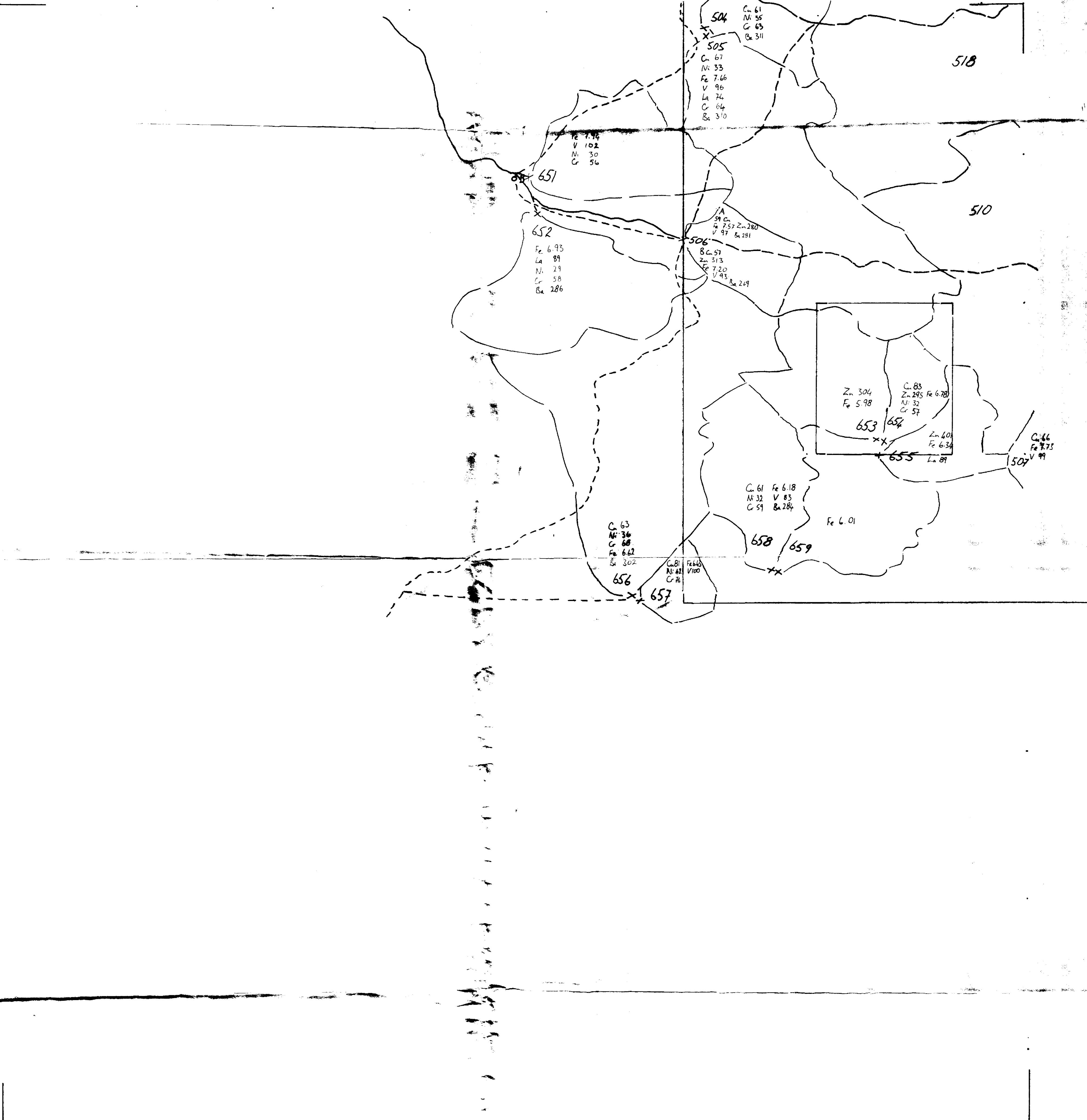
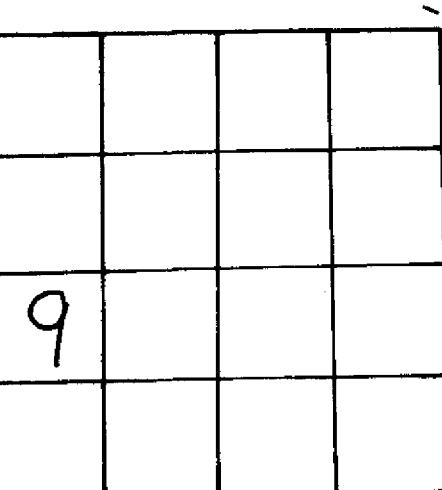
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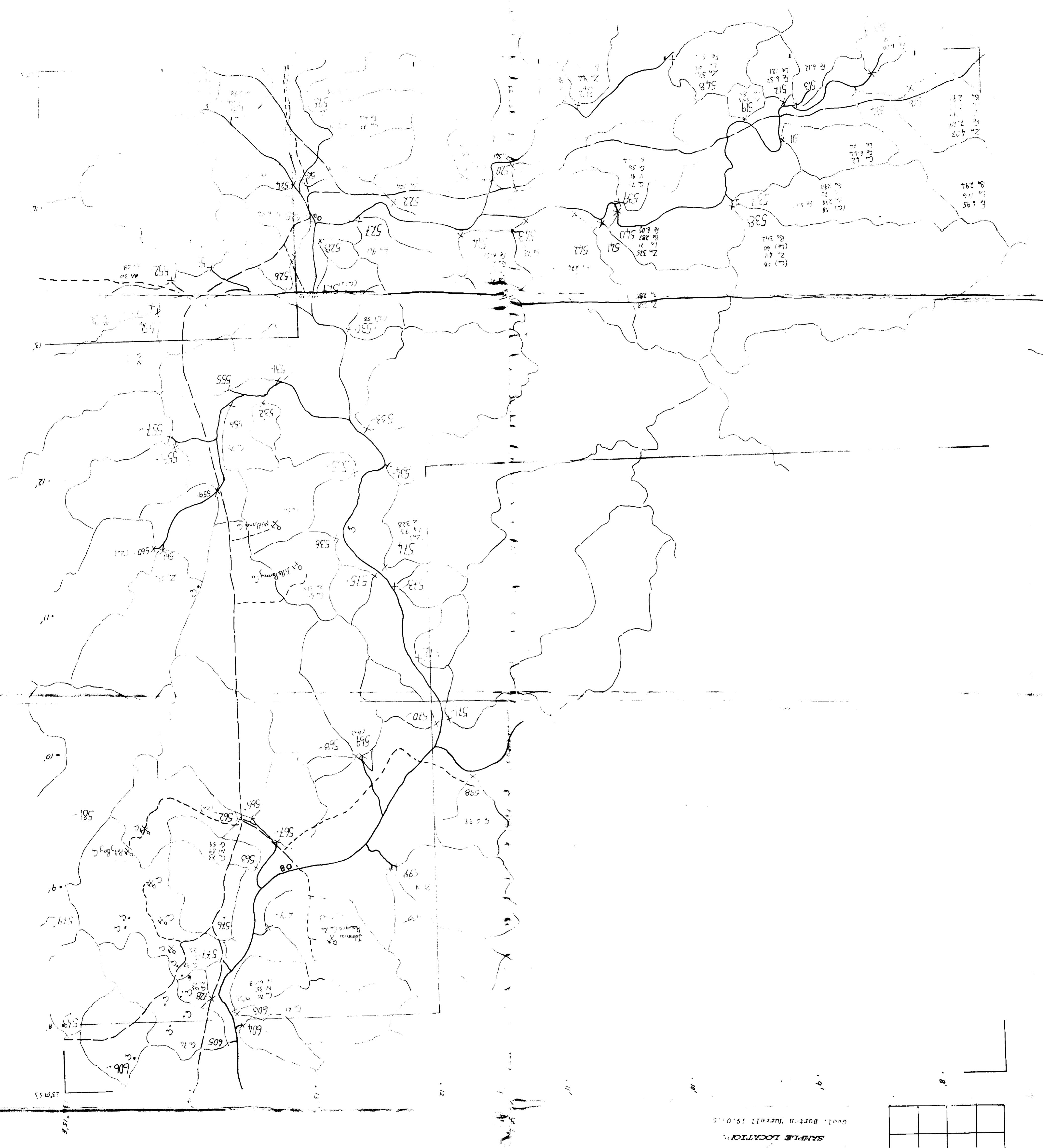
MURRELL & SATURN

EL 6899

SAMPLE LOCATIONS

Geol. Burton Murrell 19.06.91





GEOID BURTON TURRET 19.0.0.5

SAMPLE LOCATION

EL 6809

MATERIAL &amp; SATURATION

6		

LAUGHLIN APPROX 1:25,000

LAUGHLEN

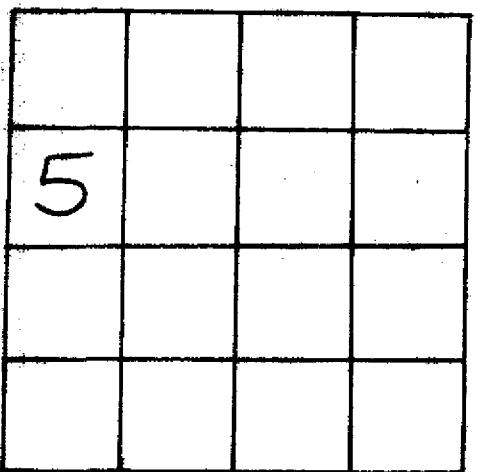
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MURKEL & SATTORI

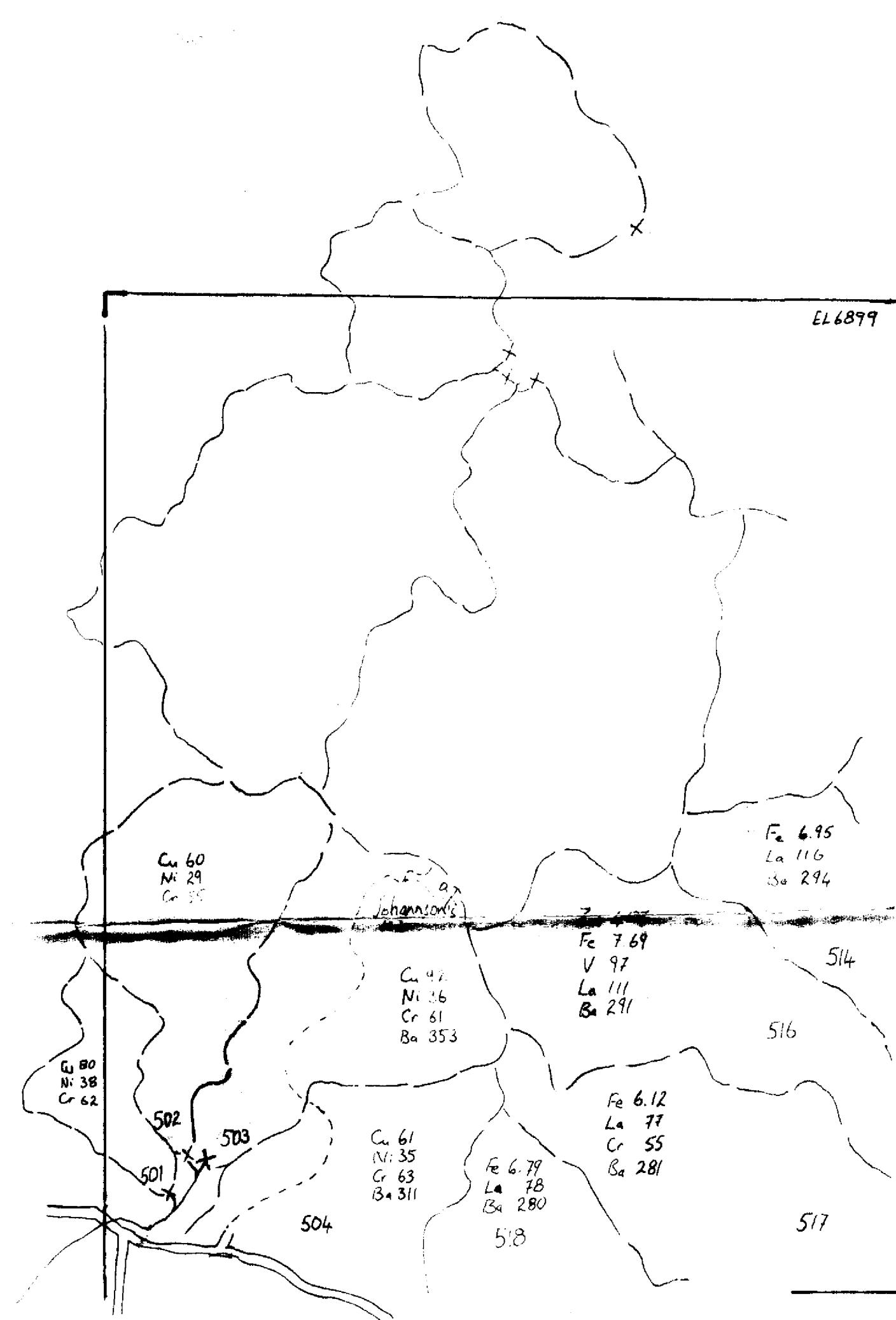
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SAMPLE LOCATIONS

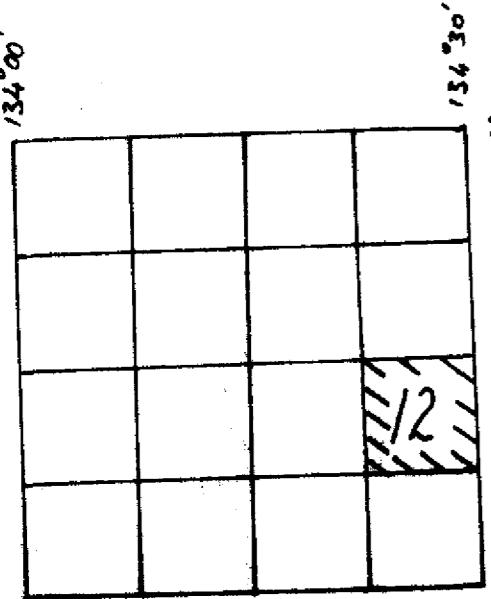
Geol. Burton SMALL 12.000



CR92/478



LAUGHLEN  
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23°30'

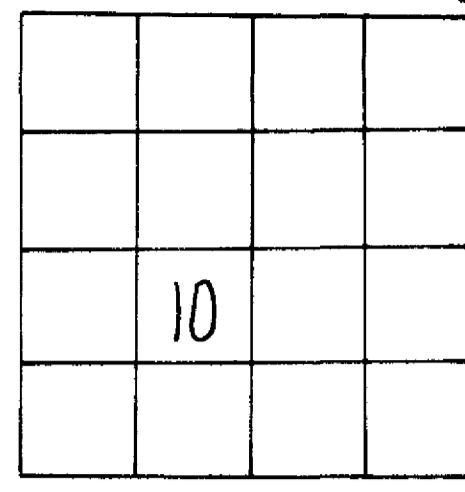
134

23°30'

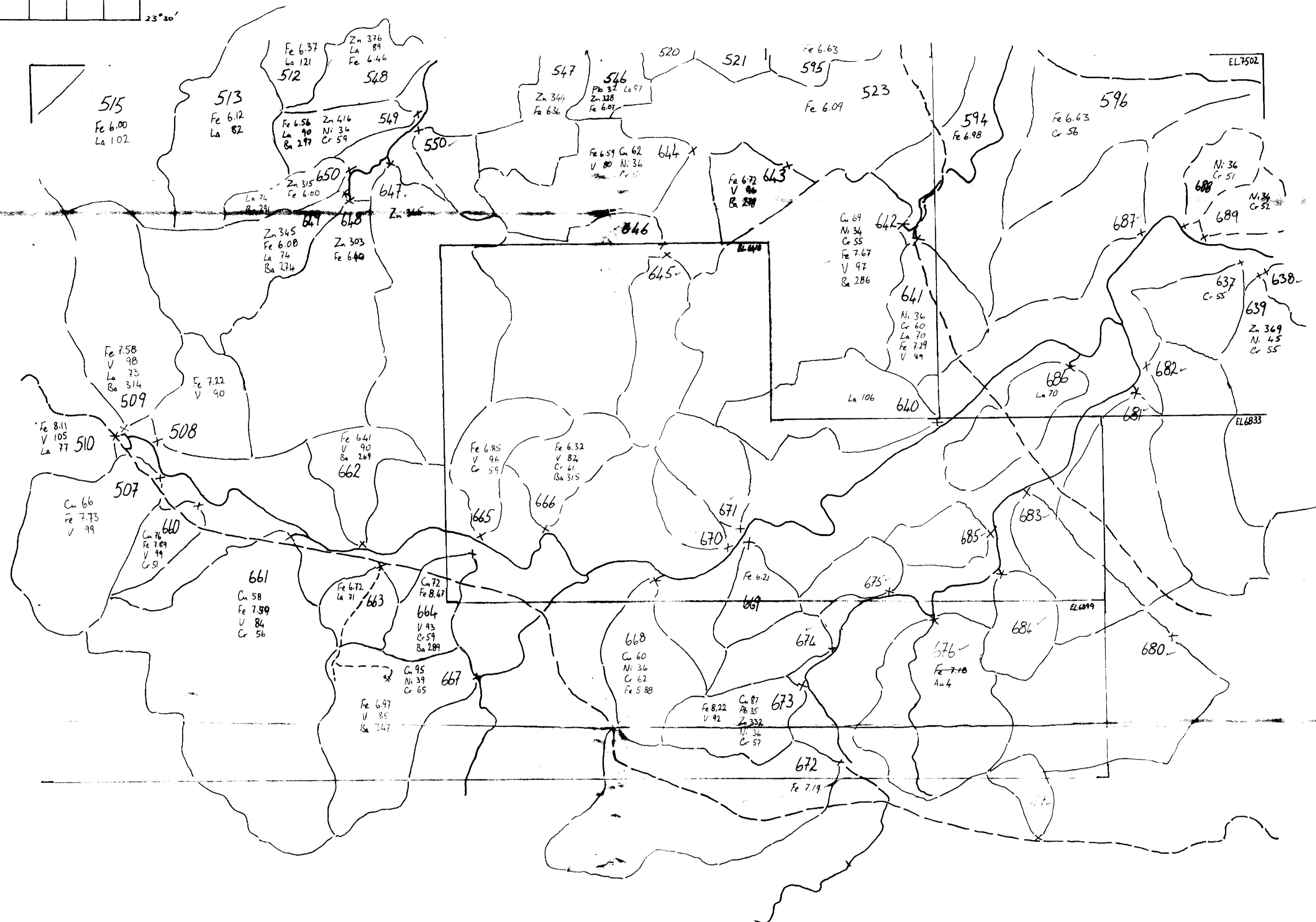


CR92/478

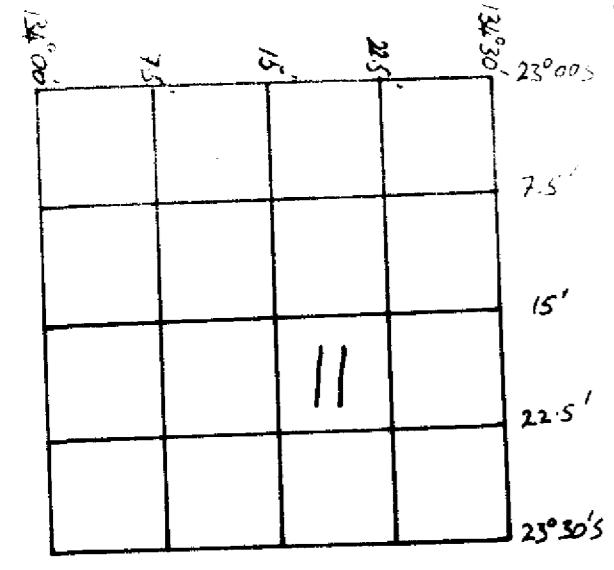
8



LAUGHLEN  
1:25,000 APPROX



LAUGHLEN  
1:25,000 APPROX



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SAMPLE LOCATIONS

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