Summary Report
on
Dewatering Operations
Spray Mine Zeehan

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CONFIDENTIAL:

SUMMARY REPORT

ON

DEWATERING OPERATIONS - SPRAY MINE,

ZEEHAN.

by

D. MacGregor.

Melbourne.

15th March, 1950.

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DE-WATERING - SPRAY MINE

ZEEHAN.

15th March, 1950.

PUMPING.

Operations prior to de-watering this Mine were commenced in July, 1948, and in general consisted of preparing the collars of the two existing shafts for the installation of pumps. The external shaft collar was found to be in good order and very little debris hindered pump lowering operations. Some delay was occasioned, however, at first starting this unit, due to the fact that the prime mover was incorrectly installed.

Whilst these operations were proceeding at the external shaft, the installing of two electrical power units and the lowering of the internal shaft 15 stage pump was almost completed. A good deal of delay was encountered in the lowering of this pump, due to the threads of the pump column being in-accurately cut.

Pumping eventually commenced from the external shaft with a fifteen stage Pomona pump at a depth of 375 feet, on the 18th January, 1949, and from the internal shaft with a similar pump at a depth of 440 feet on the 27th January, 1949. Water level at the external shaft on this date was 254 feet below the collar. Continuous pumping until 9th February, 1949, lowered the water 395 feet in the internal shaft and 355 feet in the external shaft.

Bad air was encountered in the shaft on 9th February. The water had at this time been lowered beyond No. 3 level, which level, according to old reports, was responsible for the gas generated in this mine. The gas concentration was such that it was decided that an attempt should be made to restart the natural ventilation along No. 3 level, with the hope that no further trouble would be experienced once a good flow of air was established. This action, however, became impossible, owing to the large amount of caved ground on this level and also the lack of fans to supply air to the men working on this face.

Shortly after this date two air driven fans became available and were installed in the adit entry. This arrangement did not greatly improve the bad air conditions, and it became necessary to open the old Steam Pipe Rise which connected the sub-surface plat with the surface, thereby providing a return airway. After some difficulty this rise was located and re-opened with the result that reasonably good air conditions existed in the shaft and along the levels.

At approximately this time a considerable number of pumping hours were being lost in plant shut downs to enable the electricians to re-dress the alternator slip rings.

Re-laddering of the internal shaft to No. 3 level was completed on 13th May, 1949, and "cleaning off" the northern drive had just commenced when a major set back was encountered, due to the failure of the ventilating compressor. This made further underground operations impossible until the installation of an electric fan was completed on 1st June.

Several days later, however, it became necessary to withdraw the internal pump for inspection as all efforts to increase its discharge rate were unsuccessful. The inspection of the pump turbine revealed that the impellors were very badly worn and required replacement. Replacements were obtained and pump was lowered with suction hose attached to a depth of 415 feet.

Pumping commenced again on 6th July, 1949, and No. 3 level was inspected. Very little ore was evident in what was known as "Vincent's Lode." As with the levels above, large falls or stope runs blocked both the north and south drives on the main Spray Lode.

Laddering to No. 4 level was completed and the inspection of this level revealed extensive underhand stoping of the level floor had been carried out in the southern drive. Little ore was showing in the southern face and the collapse of the northern drive prevented any entry to these parts for inspection.

The internal shaft pump again failed on 23rd July, 1949, and was withdrawn to locate the trouble. Apart from the wear the new impellors had sustained, no reason why this pump had failed was evident. Pump was replaced, tested and found to operate well.

Re-laddering was completed to No. 5 level on the 26th August, 1949, and on inspecting this level it was found that both overhead and underfoot stoping had been carried out on the southern drive. Very little stoping had been carried out north, and although this drive was blocked by a fall, little or no ore was showing in the backs that were accessible. From the appearance of the level it would suggest that the ore had occurred in wide lens of no great length, and it was in these areas that any stoping had been attempted.

Further inspection below No. 5 Level was at this time temporarily abandoned and all efforts were directed towards equipping No. 3 Level for the proposed Diamond Drilling Programme. These operations extended over several days and included the placing of air and water lines to the site, and the cutting of a drill chamber on this level.

During this time trouble was experienced with the internal pump column developing leaks at the column couplings. After several unsuccessful attempts to patch these areas it became necessary to again withdraw the pump and replace the majority of the rising main with new columns. With the completion of the above operation an inspection of the ore body below No. 5 Level was carried out.

Access below the level into two intermediate levels was obtained by means of a winze north of the internal shaft. The extent of these workings were limited and no good ore exposures were observed.

Plumbing of the bottom of the shaft from this level suggests that No. 6 Level is accessible and not under several feet of debris, as was surmised when lowering the pump.

Removal of the caved ground blocking the northern spur drive on No. 5 Level was commenced to enable the selected diamond drill site on this level to be reached. This work was proceeding when it was decided to abandon operations for the time being. Just prior to the abandonment an inspection of a small ore occurrence on No. 3 Level, north of the external shaft, was carried out. No ore was visible as this small cubby had apparently been used as a sump and was full of slurry. It was noted, however, that two distinct walls were showing and the face carried approximately six inches of quartz.

Salvage of underground equipment was completed and pumping ceased on 16th December, 1949.

SAMPLING.

Channel sampling of ore exposures on No. 3, No. 5 and the intermediate levels below 5 were obtained.

Main level sampling in almost all cases where the backs remained unstoped required the removal of timber, as both stoped and un-stoped backs were lathed. Attempts at underfoot sampling did not meet with success, due to the deep slurry and broken floors existing on the levels. The presence of foul air excluded any stope sampling and caved ground made drive ends inaccessible.

A summary of the assay results and appropriate plans are included with this report.

DIAMOND DRILLING

Drilling commenced on 27th September, 1949 and, apart from low air pressure being experienced toward the latter part of this hole, no great difficulties were met with in the ground drilled. This hole reached a total depth of 253 feet when compressor failure stopped further drilling.

GEOLOGICAL SURVEY.

All accessible adits and underground levels and workings were geologically surveyed.

CONCLUSIONS.

(a) Ore Reserves.

No. 3 Level.

The northern and southern drives of the main lode could not be inspected, as the stopes above these drives had "run".

Vincent's Lode proved most disappointing, as it was reported to be thirty feet wide. In no instance was there more than 48 inches of lode material showing in the drive backs.

No. 4 Level.

The northern drive had caved and could not be penetrated,

however, it is possible to traverse the southern drive to its limit.

No. 5 Level.

Access along the northern spur drive is blocked by a reasonably small fall, ahead of which the drive appears to be in good order. The southern drive can be traversed for 200 feet before the caved ground is reached.

Inspection of the accessible ore remaining between Nos. 3, 4 and 5 levels was disappointing as regards width and reserves. In very few places did the width of the ore body correspond with previous reports and there was no doubt that more areas had been stoped out than was shown on the old plan in existence.

Generally the condition of the External shaft and underground workings is good, and it appears that in the majority of cases the blockages mentioned have been caused by the early Tributers running the stopes to test the fill.

(b) Ventilation.

This problem, whilst responsible for delays early in the operation, can easily be overcome. It was found that a reasonably small air flow diluted the foul air to safe limits. Had it been possible to start the natural ventilation along No. 3 level, all areas would have been safe to enter.

(c) Equipment.

Considerable time was lost in the operation through the continued failure of mechanical units, namely the ventilating equipment and the internal pump.

No trouble was experienced with the External shaft pump, which operated continuously throughout the de-watering campaign, and no explanation can be advanced to show why an identical unit operating from a slightly greater depth was attended with so many failures.

Examination of the column couplings suggests the possibilities of electrolytic action occurring between the brass spider bearings and the steel-pipe. Bearing in mind that this pump was handling the bulk of

water draining through the mineralised zone and stoped sections, its acidity would be increased and the above action possible. To combat this condition all pipe threads and couplings were smeared with anti-corrosive grease when the rising main was partly renewed. This action appears to have been partly successful.

Compressor failures can be traced back to when this unit operated for long periods without inspections and maintenance being attended to. This position was also aggravated by the lack of spare parts available for this compressor in Australia.

As reported in this summary, poor slip-ring commutation of the electrical generating units was often experienced. Expert advice was obtained on this problem and, although their recommendations were carried out, little or no success in its correction was obtained.

D. MACGREGOR.

15th March, 1950.

Melbourne.

APPENDIX

SUMMARY OF SAMPLING ASSAYS

Sample No.	Assay % Pb	Assay OzAg	Assay % SB	Sample Width
No. 3 LEVEL. VINCENTS LODE.				
A-1	0.1	Nil	Nil	18 inches
A-2	0.9	0.5	"	28 "
A-3	2.6	1.8	"	21 "
A-4	4.3	2.4	"	7 "
A-5	0.5	0.3	"	29 "
A-6	1.0	0.3	"	37 "
A-7	1.5	0.7	"	31 "
A-8	Nil	Nil	"	46 "
A-9	4.1	0.5	"	8 "
A-10	0.8	0.8	"	53 "
A-11	2.3	1.2	"	36 "
A-12	1.1	0.5	"	62 "
A-13	0.4	Nil	"	27 "
A-14	4.9	1.7	"	44 "
A-15	Nil	Nil	"	74 "
A-16	5.4	5.8	0.04	7 "
A-17	0.2	0.3	Nil	36 "
A-18	0.2	Nil	"	3 "
A-19	0.1	"	"	67 "
A-20	5.0	4.9	0.46	24 "
A-21	8.4	10.4	0.04	52 "
A-22	0.6	0.6	Nil	28 "
A-23	0.8	0.3	"	45 "
A-24	7.8	1.6	0.02	42 "
A-25	11.9	6.5	0.04	29 "
A-26	9.8	4.8	0.02	15 "
A-27	1.9	1.2	Nil	10 "
A-28	2.7	2.6	"	32 "
A-29	0.1	Nil	"	28 "
A-30	0.7	0.7	"	4 "
A-31	1.5	1.1	"	3 "
A-32	0.2	Nil	"	14 "
A-33	4.7	1.1	"	20 "

Sample No.	Assay % Pb	Assay OzAg	Assay % SB	Sample Width
No. 5 LEVEL.				
A-55	10.1	3.8	5.0	Wall Samples
A-56	17.7	17.5	0.10	" "
A-57	2.5	2.2	0.06	" "
A-58	11.2	8.9	0.24	" "
A-59	30.8	17.6	0.20	" "
A-60	2.4	1.7	0.10	" "
A-61	2.4	2.0	0.20	" "
A-62	12.1	6.6	1.10	" "
A-63	0.2	0.4	0.06	" "
A-64	1.7	0.8	0.20	" "
A-65	6.0	2.3	1.0	" "
A-66	0.3	0.3	0.1	" "
A-67	1.9	6.8	0.5	" "
A-68	0.2	0.7	0.1	" "
A-69	0.3	0.8	0.1	" "
A-70	2.9	8.9	1.86	" "
A-71	12.2	320.0	2.20	" "
A-72	0.3	0.9	0.10	" "
No. 5 LEVEL. Sub-Level "A".				
A-73	3.5	21.9	2.5	12 inches
A-74	18.5	13.0	0.5	12 "
A-75	3.6	3.6	0.6	12 "
A-76	8.0	72.4	5.0	12 "
Sub-Level "B".				
A-49	4.0	20.9	1.4	57 "
A-50	10.1	3.8	5.0	36 "
A-51	0.7	5.2	0.3	120 "
A-52	4.2	3.2	1.4	72 "
A-53	7.0	3.9	1.4	48 "
A-54	2.3	54.3	0.66	48 "

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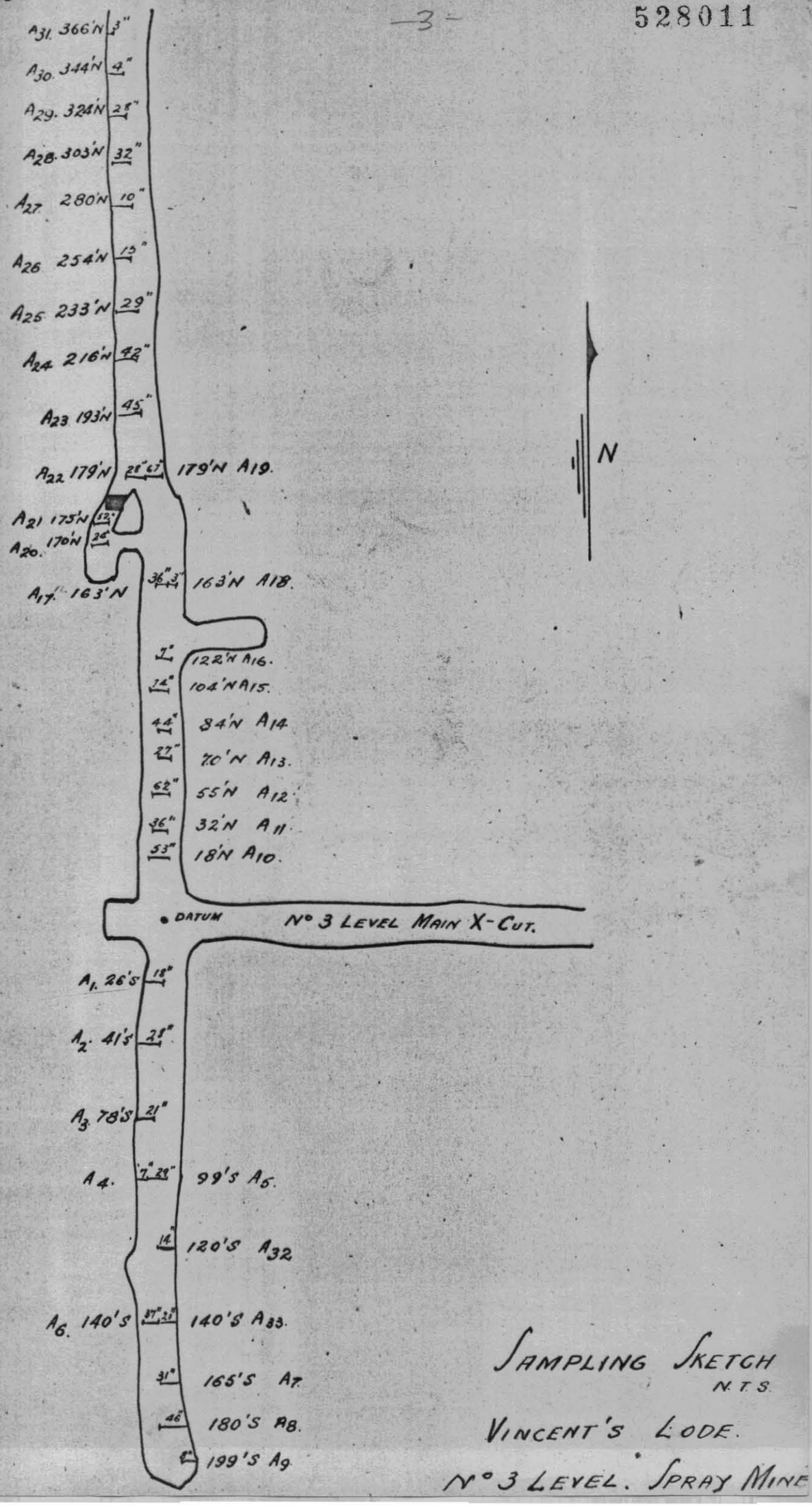

SAMPLING SKETCH
N.T.S.

VINCENT'S LODE.

No 3 LEVEL. SPRAY MINE

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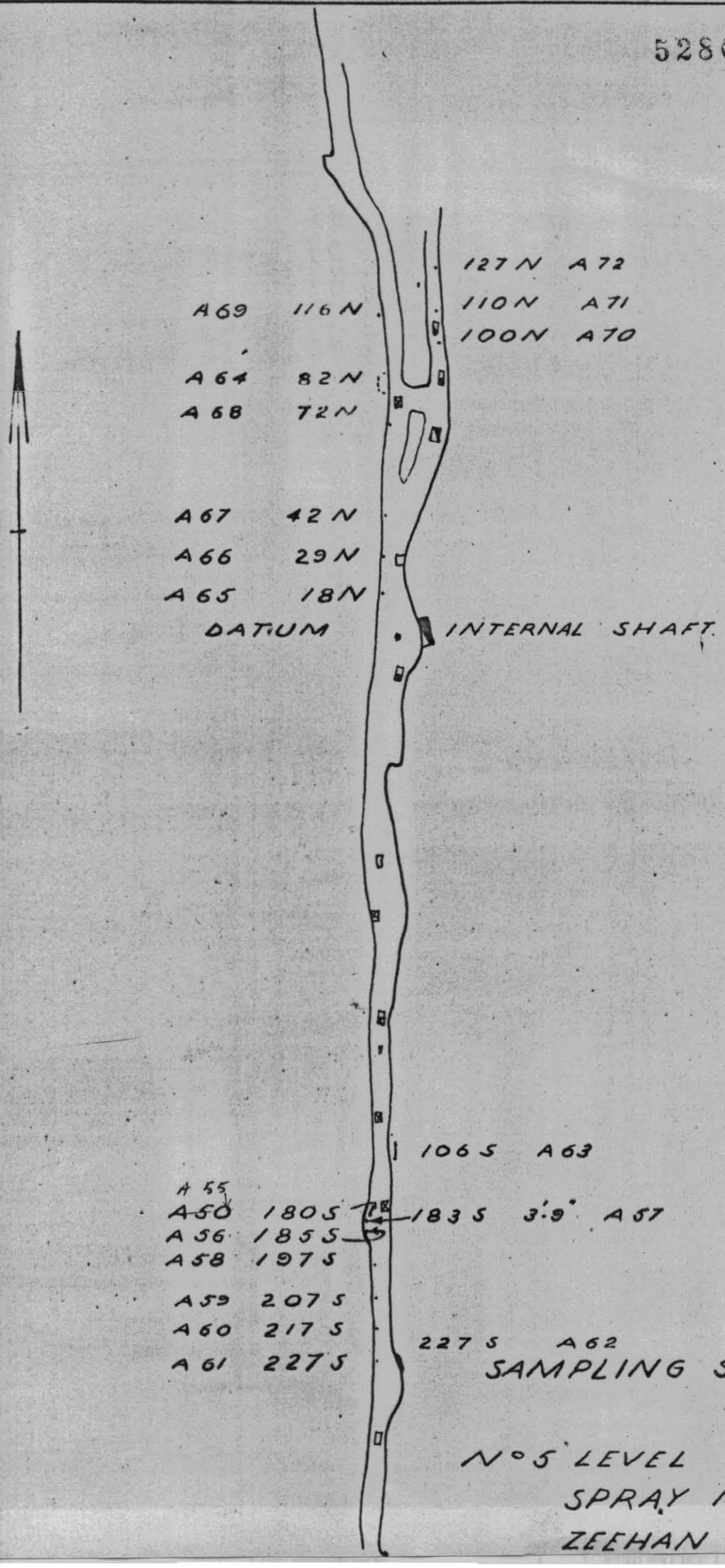

SAMPLING SKETCH
N.T.S.

N° 5 LEVEL
SPRAY MINE
ZEEHAN 1949

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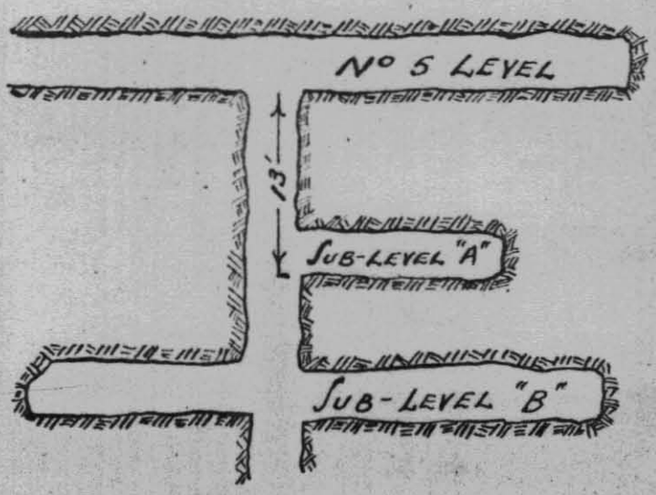
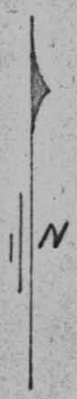
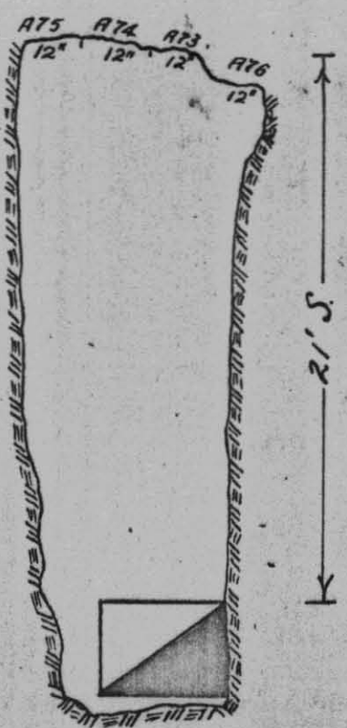


SECTION
EAST BRANCH
OF NORTH DRIVE.





PLAN.
SUB-LEVEL "A"

SAMPLING SKETCH
N. T. S.

5 cm

SPRAY MINE 1949

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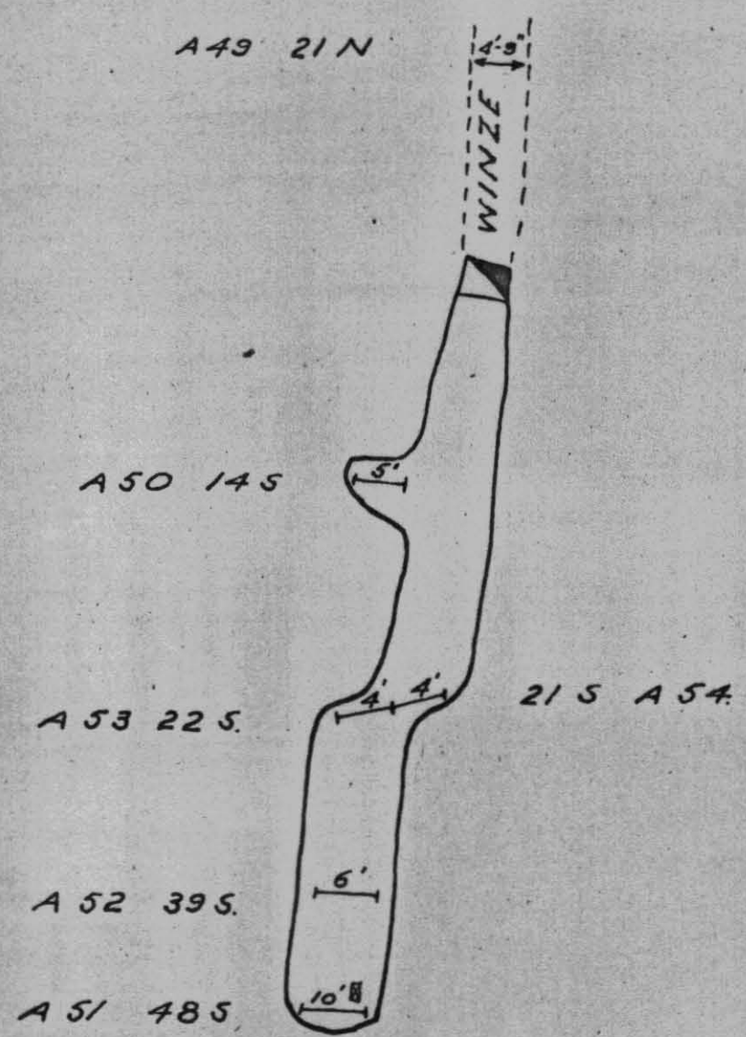
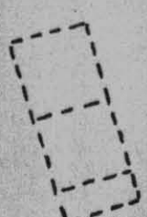




MAIN SHAFT
(APPROX. PROBABLE POSITION)

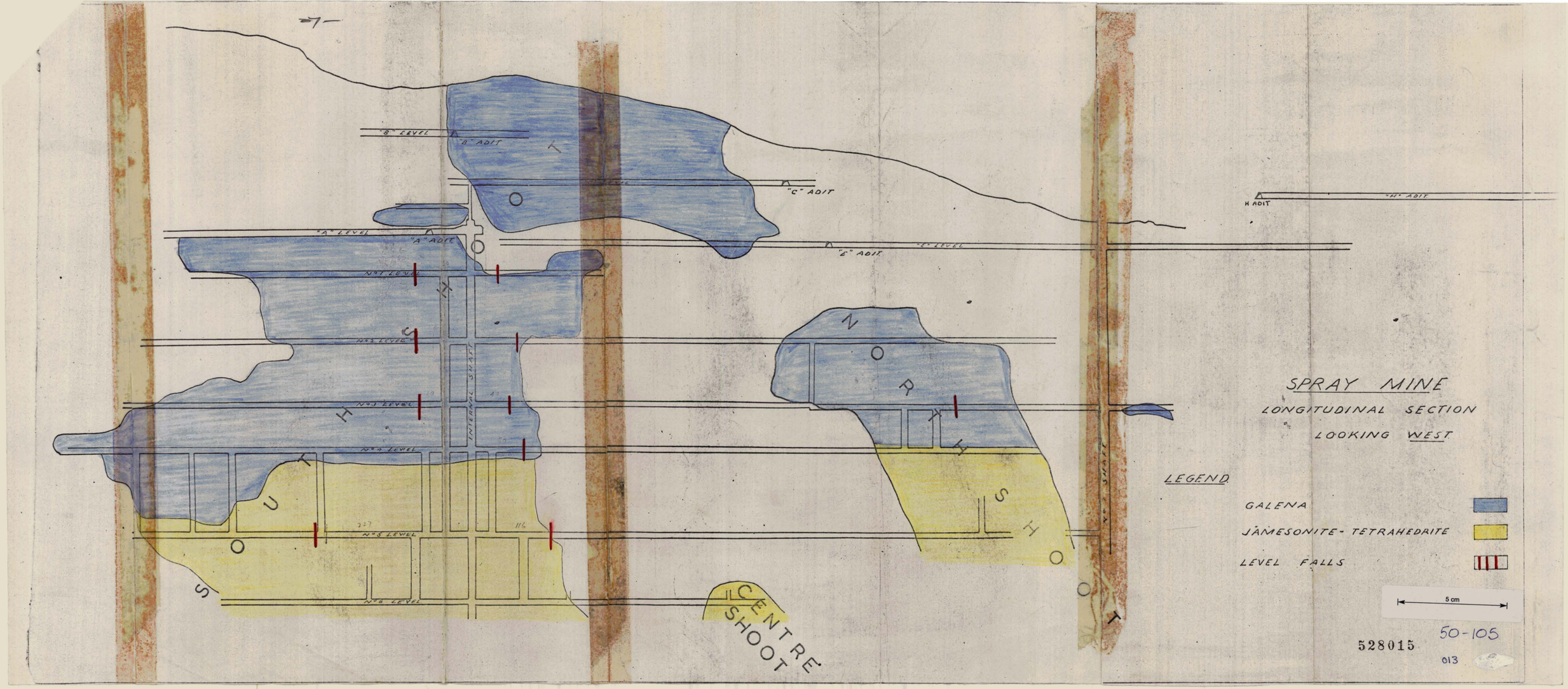
SAMPLING SKETCH

N.T.S.

SUB-LEVEL "B"

5 cm

SPRAY MINE 1944



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