

100-2-4-25

REPORT
ON A
SEISMOGRAPH SURVEY
OF
THOMPSON AND REDSTONE RIVER AREA
NORTHWEST TERRITORIES CANADA
FOR
NEW H. TODD BROS. ALBERT
DALLAS, TEXAS

HELAND EXPLORATION CANADA (1950) LTD.



REPORT ON A SEISMIC SURVEY
of
TROUT RIVER AND REDKNIFE RIVER AREAS
NORTHWEST TERRITORIES
for
NEW D. TODD BRIGGS ACCOUNT
DALLAS, TEXAS

by
HEILAND EXPLORATION CANADA (1959) LTD.
from

January 1st, 1960 to March 30th, 1960

Submitted by
E. C. Landry, Party Chief

on
April 29th, 1960

Abstracted for
Geo-Science Data Index

Date _____

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INTRODUCTION

The following is the final report of a reflection seismograph survey of Trout River and Redknife areas of the Northwest Territories for New D. Todd Briggs Account, Dallas, Texas. This survey was conducted by Heiland Exploration Canada (1959) Ltd., Party 105, between January 2, 1960 and March 30, 1960.

Included in this report are the following maps:

1. Surface Topography (Trout River).
2. Slave Point (Trout River).
3. Surface Topography (Redknife River).
4. Slave Point (Redknife River).

LOCATION OF WORK

The area covered by this report is located approximately 140 miles west of Hay River and lies between $118^{\circ} 45'$ and $120^{\circ} 30'$ longitude and between $60^{\circ} 50'$ and $61^{\circ} 08'$ latitude, about midway between Trout Lake and Kakisa Lake. The crew was quartered in a trailer camp while working these projects.

SURFACE TOPOGRAPHY

Very little surface relief was encountered in these areas. Generally, the surface slopes gently northward to the Mackenzie River. Drainage is into the Trout, Redknife and Bouvier Rivers which flow into the Mackenzie.

The area is covered lightly by stands of small timber, none of which is marketable. Numerous large muskegs are present which have an adverse effect upon record quality.

DISCUSSION OF RESULTS

The prime purpose of the survey was to map the Slave Point anomaly known to be present by well control and seismic data previously obtained in the Trout River area.

Regionally, dip is known to be south-southwest.

Steep north dips indicative of reef build-up at Slave Point level were encountered on Lines H-2, H-1, H-8, H-4, H-9, H-10, H-6, H-11 and H-5 in the Trout River Project and H-7, H-112 and H-110 in the Redknife River Project. This feature was tested unsuccessfully by Briggs Trout River 2 at S.P. 318 Line H-1, Briggs Trout River 3 at S.P. 430 Line H-6, Briggs Trout River 4, at S.P. 307 Line H-1 and Briggs Trout River 6 at S.P. 316 Line H-1. In the vicinity of Line H-110 and Line H-101, this build-up appears to fan out and lose its characteristic steep north dip.

Further east along Line H-101, a small feature is shown in the vicinity of Shot Points 22 and 23. North and east dip is indicated.

In the Redknife area, strong evidence of thrust faulting at S.P. 122 Line H-103, S.P. 718 Line H-105 and S.P. 872 Line H-116 is apparent. Displacement at all three points is about forty milli-seconds, indicating a throw of approximately 200 to 250 feet. The possibility of a single plane being associated with all three points should not be discounted in view of the poor quality of the data on Line H-115. Should this be the case, the fault would have to lie between S.P. 156 Line H-106 and S.P. 881 Line H-117.

CONCLUSIONS

In view of the disappointing reef tests in the Trout River area, the

Redknife River area appears most encouraging at this time.

In planning a deep test program, consideration should be given the fault indications on Lines H-105, H-103 and H-116.

Yours very truly,

HEILAND EXPLORATION CANADA (1959) LTD.



E. C. Landry,
Party Chief

ECL:rdt

APPENDIX

EQUIPMENT AND RECORDING TECHNIQUE

Southwestern Industrial Electronics Company truck mounted equipment was used to obtain seismograms.

The amplifiers were Model GA-7H with a PRO-11-10 oscillograph. All depth shots fired were recorded on magnetic tape by a Model MR-4 magnetic tape recorder.

Winter-Weiss truck mounted drills were used to drill the shot holes.

Continuous sub-surface control was obtained by using a split spread with an effective distance of 1440-120-0-120-1440 feet. Two detectors per group (Electro-Tech Model EVS-2A, 27 cycles per second) spaced 30 feet apart were used with this spread distance.

All shots were recorded unmixed with a filter setting initially of 1-32-0 later changed to 1-38-0. The AVC setting was F-3 and gain setting was generally 70%. An unmixed playback using a 1-32-0 filter (later changed to 1-38-0), F-3 AVC and 35% gain was made from each tape. A 20% bi-directional mixed playback using the same settings was also produced from each tape.

Drilling conditions while varying widely were generally good although finding water was at times a problem.

SURVEYING

The horizontal survey was conducted with a Wild T-1 Theodolite, vertical survey with a Gurley alidade. Star shots were taken to obtain and tie azimuth control.

COMPUTING PROCEDURE

Corrections to a datum of plus 950 feet at 13,500 feet per second were applied to the records by the use of the "Up-hole" method. Where holes were bottomed above the consolidated limestone formation, drift corrections were applied using a modification of the Intercept Method devised by Mr. J. A. Legge, Jr.

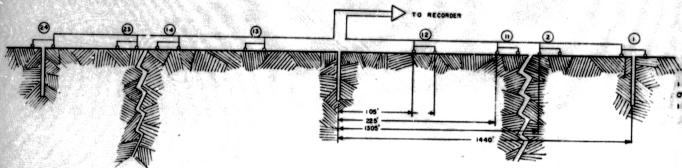
In some instances, the first arrival plots showed an intermediate velocity averaging 12,000 feet per second, gradually increasing in thickness to the south. This is thought to be a pinch-out of Cretaceous or Mississippian age. Northern contacts of this wedge were at S.P. 356 Line H-2, S.P. 391 Line H-4, S.P. 471 Line H-5 and S.P. 839 Line H-100. Of necessity, a break in contouring occurs at these points as indicated on both Slave Point maps.

Corrected record sections of all lines shot were reproduced by Canadian Magnetic Reduction (Alberta) Ltd. from data supplied by Heiland Exploration Canada (1959) Ltd.

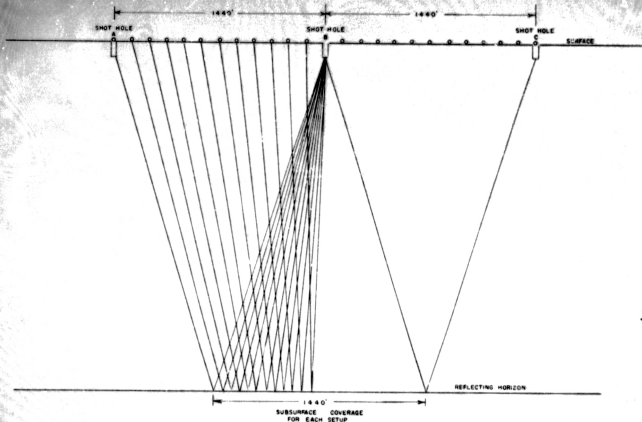
SUPERVISION

Mr. J. A. Legge, Jr., a geophysical consultant with offices in Calgary, Alberta, was supervisor on behalf of New D. Todd Briggs Account and kept in close touch with the progress of the work by personal visits to the crew and by telegraph reports which were dispatched by the field crew to his Calgary office.

Supervision on behalf of Heiland Exploration Canada (1959) Ltd. was carried out by Mr. James Barron who maintained close contact at all times with the field crew.



DETECTOR SPREAD DIAGRAM
2 GEOPHONES PER TRACE



○ SYMBOL FOR DETECTOR GROUP
 FOR DETAILS OF GROUP SEE
 DIAGRAM ON DETECTOR SPREAD



**LOCATION PLAT
TROUT RIVER AND REDKNIFE RIVER AREAS
NORTHWEST TERRITORIES
CANADA**

AREA SHOT 

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
1	530320 530304	531310
2	530305	531309
3	530306 530307	531308
4	530318 530319 530303	531307
5	530320 530308	531306
6	530309	531305
7	530310 530311	531304
8	530321 530322 530323 530324 530312	531303
9	530325 530326	531302
10	530327 530328 530313 530314	531301
11	530329 530330 530315 530316	531300
12	530334	531299
13	530339 530340	531298
14	530342	531297

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
15	530331 530333 530335	531296
16	530336 530337	531295
17	530338	531294
18	530341	531293
19	530343 530344	531292
20	530345 530346	531291
21	530347	531290
22	530348 530349	531289
23	530350 530351	531288
24	530352	531287
25	530353	531286
26	530354	531285
27	530355	531284
28	530356	531283
29	530357	531282
30	530358	531281
31	530359 530360	531280
32	530361	531279
33	530362	531278
34	530363	531277

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
35	530364 530365	531276
36	530366	531275
37	530367	
38	530368	
39	530369	
40	530370 530371	
41	530372	
42	530373 530374	
43	530375	
44	530376	
45	530377	
46	530378	
47	530379	
48	530380	
49	530381	
50	530382	
51	530383	531350
52	530384	531349
53	530385 530386	
54	530387	531347
55	530388	531346
56	530389	531345

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
57	530390	531344
58	530391	531343
59	530392	531342
60	530393	531341
61	530394	531340
62	530395	531339
63	530396	531338
64	530397	530337
65	530398	531325
66	530399	531326
67	530400	531327
68	530401	531328
69	530402	531329
70	530403	531330
71	530404	531331
72	530405	531332
73	530406	531333
74	530407	531334
75	530416	531335
76	530417	531336
85	530408	544891
86	530409 530410	544892
87	530411	544893
88	530412	544894

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
89	530413	544895
90	530414	544896
91	530415	544897
92	530418	544898
93	530419	544899
94	530420	544900
95	530421	544901
96	530423	544902
97	530422	544903
98	530424	544904
99	530425	544905
100	530426	489386
101	530427	489387
102	530428	489388
103	530429	489389
104	530430	425632
105	530431	425624
106	530432	425625
107	530433	425626
108	530434	425627
109	530435	425628
110	530437	425629
111	530438	425630
112	530439	425631

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
113	530440	425632
114	530441	425633
115	530442	425634
116	530443	425635
117	530444	425636
118	530445	425637
119	530446	425638
120	530447	425639
121	530448	425640
122	530449	425641
123	530450	425642
124	530451	425643
125	530452	425644
133	530453	425645
134	530454	425646
135	530455	425647
136	530456	425648
137	530457	425649
138	530458	425650
139	530459	544651
140	530460	544652
141	530461	544653
142	530462	544654
143	530463	544655
144	530464	544656

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
145	530465	544657
146	530466	544658
147	530467	544659
148	530468	544660
149	530469	544661
150	530470	544662
151	530471	544663
152	530472	544664
153	530473	544665
154	530474	544666
155	530475 530476	544667
156	530477 530478	544668
85	530408	545718
157	530479	545717
158	530480	545716
159	530481	545715
160	530482	545714
161	530483	545713
162	530484	545712
163	530485	545711
164	530486	545710
165	530487 530488	545709
166	530489	545708

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
167	530490	545707
168	530491	: 45706
169	530492	545705
170	530493	545703
169A	530494	544925
176	530495	544924
177	530496	544923
178	530497	544922
179	530498	544921
180	530499	544920
181	530500	544919
182	530501	544918
183	530502	544917
184	530503	544916
185	530504	544915
186	530505	544914
187	530506	544913
188	530507	544912
189	530508	544911
190	530509	544910
191	530510	544909
192	530511	544908
193	530512	544907
301	525380	
	525381	
	525382	511431

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
302	525383 525384	511432
303	525385 525386	511433
304	525387 525388	511434
305	525389 525390	511435
306	525392	511436
307	525393 525394	511437
308	525395	511438
309	525396	511439
310	525397	511440
311	525398	511441
312	525399	511442
313	525400	511443
314	525401	511444
315	525402	511445
316	525403	511446
317	525404	511447
318	525405	511448
319	525406	511449
320	525407	511450
321	525408	531251
322	525409	531252
323	525410 525411	531253

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
324	525412 525413	531254
325	525414 525415	531255
328	525416 525417	531256
326	525418 525419	
327	525420	
328A	525421	531257
329	525422 525423	531258
330	525424	531259
331	525425	531260
332	525426	531261
333	525427	531262
334	525428	531263
335	525429	531264
336	525430 525441	531265
337	525431	531266
338	525432	531267
339	525433	531268
340	525434	531269
341	525435	531270
342	525436	531271
343	525437	531272

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
344	525438 525439	531273
345	525440	531274
346	525447	531315
347	525446	531315
348	525445	531316
349	525444	531317
350	525443	531318
351	525442	531319
335A	525449	531320
352	525450	531321
353	525451	531322
354	525452	531323
355	525453 525467	489373
356	525454 525455	
357	525456	589374
358	525457	489375
359	525458	489376
360	525459	489377
361	525460	489378
362	525461	489379
363	525462	489380
364	525463	489381
365	525464	489382

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
366	525468	489383
367	525469	489384
368	525470	489385
369	525448	531313
370	525465	531312
371	525466	531311
301A	525471	531365
372	525472	531366
373	525473	531367
374	525474	531368
375	525475	531369
376	525476	531370
377	525477	531371
378	525478	531372
379	525479	531373
380	525480	531374
381	525481	531375
382	525482	531376
383	525483	531377
384	525484	531378
385	525485	531379
386	525486 525487	531380
387	525488	531381
388	525489	531382

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
389	525490	531383
390	525491	531384
391	525492	531385
392	525493	531386
393	525494	531387
394	525495	531388
395	525496	531389
396	525496	531390
397	525498	531391
398	525499	531392
399	525500	531393
400	525501	531394
401	525502	531395
402	525503	531396
403	525504	531397
404	525505	531398
405	525506	531399
406	525507	531400
407	525508	489368
408	525509	489369
409	525510	489370
410	525511	489371
411	525512	489372
412	525513	544886
413	525541	544887

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
414	525542	544888
415	525543	544889
416	525544	544890
417	525514	544669
418	525515	544670
419	525516	544671
420	525517	544672
421	525518	544673
422	525519	544674
423	525520	544675
424	525521 525522	544676
425	525523	544677
426	525524	544678
427	525525	544679
428	525526	544680
429	525527 525528	544681
430	525529	544682
431	525530	544683
432	525531 525532	544684
433	525533	544685
434	525534	544686
435	525535	544687

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
436	525536	544688
437	525537	544689
438	525538	544690
439	525539	544691
440	525540	544692
441	525545	544693
442	525546	544694
443	525547	544695
444	525548	544696
445	525549	544697
446	525550	544698
447	525601	544699
448	525602	544700
449	525603	544801
450	525604	544802
451	525605	544803
452	525606	
	525607	544804
453	525609	544805
454	525610	544806
455	525611	544807
456	525612	544808
457	525613	544809
458	525614	544810
459	525615	544811

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
460	525616	544812
461	525617	544813
462	525618	544814
463	525619	544815
464	525620	544816
465	525621	544817
466	525622	544818
467	525623	544819
468	525624	544820
469	525641 525642	544821
470	525643 525644	544822
471	525645	544823
472	525646	544824
473	525647	544825
474	525648	544826
311A	525625	544848
475	525626	544849
476	525627	544850
477	525628	544851
478	525629	544852
479	525630	544853
480	525631 525632	544854
481	525633	544855

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
482	525634	544856
483	525635	544857
484	525636	544858
485	525637	544859
486	525638	544860
487	525639	544861
488	525640	544862
489	525649	544827
490	525650	544828
491	525651	544863
492	525652	544864
493	525653	544865
494	525654	544866
495	525655	544867
496	525656	544868
497	525657	544869
498	525658	544870
499	525659	544871
500	525660	544872
501	525661	544873
502	525662	544874
503	525663	544875
504	525664	544876
505	525665	544877

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
506	525666	544878
507	525667	544879
508	525668	544880
509	525669	544881
510	525670	544882
511	525671	544883
512	525672	544884
513	525673	544885
514	525674	544830
515	525675	544831
516	525676	544832
517	525677	544833
518	525678	544834
519	525679	544835
520	525680	544836
522	525681	544837
523	525682	544838
524	525683	544839
525	525684	44840
526	525685	544841
527	525686	544842
528	525687	544843
529	525688	544844
530	525689	544845

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
531	525690	544846
532	525691	544847
533	525692 525693	544926
534	525694	544927
535	525695 525696	544928
536	525697	544929
537	525698	544930
538	525699	544931
539	525700	544932
540	525701	544933
541	525702	544934
542	525703	544935
543	525704	544936
544	525705	544937
545	525706	544938
546	525707	544939
547	525708	544940
548	525709	544941
549	525710	544942
550	525711	544943
551	525712	495520
552	525713	495521
553	525714	495522

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
554	525715	495523
555	525716	495524
556	525717	495525
557	525718	495526
558	525719	495527
559	525720	495528
560	525721	495529
561	525722	495530
562	525723	495531
563	525724	495532
564	525725	495533
565	525726	495534
566	525727	495535
567	525728	495536
568	525729	495537
569	525730	495538
570	525731	495539
571	525732	495540
572	525733	544944
573	525734	544945
574	525735	544946
575	525736	544947
576	525737	544948
577	525738	544949
	525739	

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
578	525740	544950
579	525741	495501
580	525742	495502
581	525743	495503
582	525744	495504
583	525745	495505
584	525746	495506
585	525747	495507
586	525748	495508
587	525749	495509
588	525750	495510
589	525751	495511
590	525752	495512
591	525753	495513
592	525754	495514
593	525755	495515
594	525756 525757	495516
595	525758	495517
596	525759	495541 556455
597	525760 525761	495542
598	525762	495543
599	525763	495544
600	525764	495545

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
601	525765	495546
602	525766	495547
603	525767	495548
604	525768	495549
605	525769	495550
606	525770	545701
607	525771	545702
608	525772	545704
609	525773	545794
610	525774	545795
611	525775	545796
612	525776	545797
613	525777	545798
614	525778	545799
615	525779	545800
616	525780	556451
617	525781	556452
618	525782	556453
619	525783 525784	556454
620	525785	545767
621	525786	545768
622	525787	545769
623	525788	545770
624	525789	545771

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
625	525790	545772
626	525791	545773
627	525792	545774
628	525793	545775
629	525794	545776
630	525795	545777
631	525796	545778
632	525797	545779
633	525798	545780
634	525799 525800	545781
635	546651	545782
636	546652	545783
637	546653	545784
638	546654	545785
639	546655	545786
640	546656	545787
641	546657	545788
642	546658	545789
643	546659	545790
644	546660	545791
645	546661	545792
646	546662	545793
525A	546663	545766
647	546664	545765

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
648	546665	545764
649	546666	545763
650	546667	545762
651	546668	545761
652	546669	545760
653	546670	545759
654	546561	545758
655	546672	545757
656	546673	545756
657	546674	545755
658	546675	545754
659	546676	545753
660	546677	556456
661	546678	556457
662	546679	556458
663	546680	556459
664	546681 546682	556460
665	546683	556461
666	546684	556462
667	546685	556463
668	546686	556464
669	546687	556465
670	546688	556466
671	546689	556467

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
672	546690	556468
673	546691	556469
674	546692	556470
675	546693 546694	556471
676	546695	556472
677	546696	556473
678	546697	556474
679	546698	556475
680	546699	556476
681	546700	556477
682	546701	556478
683	546702	556479
684	546703	556480
685	546704	556481
686	546705	556482
687	546706	556483
688	546707	556484
689	546708	556485
690	546709	556486
691	546710	556487
692	546711	556488
693	546712	556489
694	546713	556490
695	546714	556491

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
696	546715	556492
697	546716	556493
698	546717	556494
699	546718	556495
700	546719	556496
701	546720	556497
702	546721	556498
703	546722	556499
704	546723	556500
705	546724	556551
706	546725	556552
707	546726	556553
708	546727	556554
709	546728	556555
710	546729	556556
711	546730	556557
712	546731	556558
713	546732	556559
714	546733	556560
715	546734	556561
716	546735	556562
717	546736	556563
718	546737	556564
719	546738	556565
720	546739	556566

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
721	546740	556567
722	546741	556568
723	546742	556569
724	546743	556570
725	546744	556571
726	546745	556572
727	546746	556573
728	546747	556574
729	546748	556575
730	546749	556576
731	546750	556577
732	546756	556578
733	546759	556579
734	546760	556580
735	546761	556581
736	546762	556582
737	546763	556583
738	546764	556584
739	546765	556585
740	546767	556586
741	546768	556587
742	546769	556488
743	546770	556589
744	546771	556590

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
745	546772	556591
746	546773 546774	556592
747	546775	556593
748	546776	556594
749	546777	556595
750	546778	556596
751	546779	556597
752	546780	556598
753	546781	556599
754	546782	573084
755	546783	573085
756	546784	573086
757	546785 546786	573087
758	546787	573088
759	546788	573089
760	546789	573090
761	546790 546791	573091
762	546792	573092
763	546793	573093
764	546794	573094
765	546795	573095
766	546796 546797	573096

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
767	546798 546799	573097
768	546800 546801	573098
769	546802	573099
770	546803	573100
771	546804	573101
772	546805	573102
773	546806	573103
774	546807	573104
775	546808	573105
776	546809	573106
777	546810	573107
778	546811	573202
779	546812	573201
780	546813	573069
781	546814	573068
782	546815	573067
783	546816	573066
784	546817	573065
785	546818	573064
786	546819	573063
787	546820	573120
788	546821	573121
789	546822	573122
790	546823	573123

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
791	546824	573124
792	546825	573125
793	546826	573126
794	546827	573127
795	546828	573128
796	546829	573119
797	546830	573118
798	546831	573117
799	546832	573116
800	546833	573115
801	546834	573114
689A	546865	573203
802	546835	573204
803	546836	573205
804	546837	573206
805	546838	573207
806	546839	573208
807	546840	573209
808	546841	573210
809	546842	573211
810	546843	573212
672A	546857	573225
811	546858	573226
812	546859	573227

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
813	546860	573228
814	546861	573229
815	546862	573230
816	546863	573231
817	546864	573232
818	546860	573224
819	546854 546855	573223
820	546853	573222
821	546852	573221
822	546851	573220
823	546850	573219
824	546849	573218
825	546848	573217
826	546847	573216
827	546846	573215
828	546845	573214
829	546844	573213
689A	546865	573203
170A	546866	573113
830	546867	573112
831	546868	573111
832	546869	573110
833	546870	573109
834	546871	573108

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
753A	546872	573150
835	546873	573149
836	546874	573148
837	546875	573147
838	546876	573146
839	546877	573145
840	546878	573144
841	546879	573143
842	546880	573142
843	546881 546882	573141
844	546883	573140
845	546884	573139
846	546885	573138
847	546886	573137
848	546887	573136
849	546888	573135
850	546889	573134
851	546890	573133
852	546891	573132
853	546892	573131
854	546893	573130
855	546894	573129
856	546908	573070
857	546907	573071

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
858	546906	573072
859	546905	573073
860	546904	573074
861	546903	573075
862	546902	573076
863	546901	573077
864	546900	573078
865	546899	573079
866	546898	573080
867	546897	573081
868	546896	573082
869	546895	573083
870	546909	556928
871	546910	556929
872	546911	556930
873	546912	556931
874	546913	556932
875	546914	556933
876	546915	556934
877	546916	556935
878	546917	556936
879	546918 546919	556937
880	546920	556938
881	546921	556939

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
882	546922	556940
883	546923	556941
884	546924	556942
885	546925	556943
886	546926	556944
887	546927	556945
888	546928	556946
889	546929	556947
890	546930	556948
891	546939	556949
892	546940	556950
893	546941	573051
894	546942	573052
895	546943	573053
896	546944	573054
897	546931	573055
898	546932	573056
899	546933	573057
900	546934	573058
901	546935	573059
902	546936	573060
903	546937	573061
904	546938	573062
905	546945	556600

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
906	546946 546947	556901
907	546948	556902
908	546949	556903
909	546950	556904
910	571601	556905
911	571602	556906
912	571603	556907
913	571604	556908
914	571605	556909
915	571606	556910
916	571607	556911
917	571608	556912
918	571609	556913
919	571610	556914
920	571611	556915
921	571612	556916
922	571613	556917
923	571614	556918
924	571615	556919
925	571616	556920
926	571617	556921
927	571618	556922
928	571619	556923

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
929	571620	556924
930	571621	556925
931	571622	556926
932	571623	556927

600-1-4-48

REPORT
ON A
SEismic SURVEY
OF THE
WEST TATULORA LAKE AREA
NORTHWEST TERRITORIES CANADA
FOR
NEW D. TOWN PROSPECTS ALBERTA
DANFAS, TEXAS

HELAND EXPLORATION CANADA (1959) LTD.

508-11-4-43



REPORT ON A SEISMIC SURVEY

of

WEST TATHLINA LAKE AREA

NORTHWEST TERRITORIES

for

NEW D. TODD BRIGGS ACCOUNT

DALLAS, TEXAS

by

HEILAND EXPLORATION CANADA (1959) LTD.

from

December 7th, 1959 to February 12th, 1960

Submitted by

James Barron, Supervisor

on

April 14th, 1960

Abstracted for
Geo-Science Data Index
Date _____

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Introduction

The following is a final report of a reflection seismic survey of the West Tathlina Lake Area in the Northwest Territories for New D. Todd Briggs Account, Dallas, Texas. This survey was conducted by Heiland Exploration Canada (1959) Ltd., Party 105 from December 7th, 1959 to December 20th, 1959, and from February 3rd to February 12th, 1960, by Party 108.

The following maps accompany this report.

1. Surface Topography
2. Slave Point
3. Shot Point Location

Location of Work

The area covered by this report is located northwest of Tathlina Lake in the Northwest Territories and lies between $60^{\circ} 35'$ and $60^{\circ} 45'$ latitude and between $117^{\circ} 30'$ and $118^{\circ} 00'$ longitude. The crew was quartered in a trailer camp which was located near the site of Briggs West Tathlina Lake No. 1 for the work conducted by Party 105. Party 108 located their camp near the site of Briggs West Tathlina Lake No. 3.

Topography

Very little topographical relief was encountered in the area covered by this survey. The contoured surface topography map which accompanies this report shows the area sloping gently northward. The highest elevation encountered was at Shotpoint 682 where an elevation of 999 feet was recorded. The lowest elevation encountered in the survey was 875 feet which occurs at Shot Point 663.

The area was partially covered by small stands of light spruce.

Numerous muskegs were present in the area and caused some difficulty early in December before colder weather set in. Crawler tractors with dozer blades were used to clear lines in the area.

Discussion of Results

Lines H - 11 and H - 12 located north of Tathlina Lake tend to verify the existence of a normal fault as indicated on the Slave Point map which accompanies this report. Although record quality across the fault is very poor, the reflection correlations between the syncline on the down side and points on the up side are quite good.

The predominant feature on the Slave Point map is a narrow anticline which lies along a northeast - southwest axis. Good north dip indications are evident on the records obtained from Shot Points 633, 634 and 635, on Line H - 13, and Shot Points 651, 670, 650 and 669 on Line H - 14. A study of the corrected record section for Line H - 13 suggests that even more dip is present along the north flank of the anticline than is indicated on the map. This feature has been tested by Briggs West Tathlina Lake No. 1 located near Shot Point 8 - 313 on Line No. F - 8, Briggs West Tathlina Lake No. 2 located near Shot Point 636 on Line No. H - 13, and Briggs West Tathlina Lake No. 3, which is located near Shot Point 7 - 132 on Line F - 7.

Line H - 15 which was shot after the drilling of Briggs West Tathlina Lake No. 3 encountered considerably higher Slave Point values at Shot Points 690 and 692. A northwest - southeast line shot across the anomaly near these high values would be desirable to give a more complete evaluation.

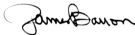
Conclusions

The Slave Point structure discussed above has been tested by

the three Briggs West Tathlina Lake wells which failed to find commercial production. If further drilling is planned in this area, it is felt consideration should be given to a location near Shot Point 692 which is located two and one half miles northeast of Briggs West Tathlina No. 3.

Respectfully submitted,

HEILAND EXPLORATION CANADA (1959) LTD.

A handwritten signature in cursive script, appearing to read "James Barron".

James Barron,
Supervisor.

APPENDIX

Equipment and Recording Technique

Southwestern Industrial Electronics Company (S. I. E.) truck mounted equipment was used to obtain the seismograms.

The amplifiers were Model GA-7H with a PRO - 11 - 10 oscillograph. All shots fired were recorded on magnetic tape by a Model MR-4 magnetic tape recorder.

Winter-Weiss and Mayhew truck mounted drills were used to drill the shot holes. The remainder of the equipment used was also truck mounted.

Continuous subsurface control was obtained by using a split spread with an effective distance of 1440 - 120 - 0 - 120 - 1440 feet. Two detectors per group (Electro-Tech Model EVS-2A 28 cycle) spaced 30 feet apart were used with this spread distance.

All shots were recorded with no mix and a filter setting of 1 - 38 - 0. The AVC setting was F - 3, and gain setting was generally 70%. An unmixed playback using a 1 - 38 - 0 filter setting, F-3 AVC, and 40% gain was made from each tape. A 20% bi-directional mixed playback using the same settings was also made from each tape.

Most holes were drilled into limestone and charges averaging 1 - 2 pounds were used. Poor record quality in the area was generally attributed to muskeg and a variable layer of extremely low velocity material which blankets the limestone in the area.

Experiments were conducted using multiple geophones at various intervals. The results of these tests indicated that two geophones spaced 30 feet apart generally gave the best results. Some experimenting was also

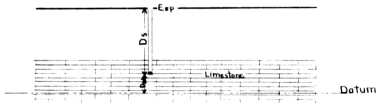
done with multiple shot holes, the results of which were inconclusive.

Surveying

The survey was conducted with a Wild T - 1 Theodolite. Horizontal and vertical control were carried from previously surveyed shot points in the area. Several star shots were taken to obtain azimuth control in the area.

Computing Procedure

Corrections to a datum of plus 950 feet were applied to the records by the use of the Uphole Time method.



$$Es = Esp - Ds$$

$$Dsd = Es - Ed$$

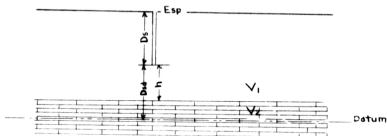
$$Tsd = \frac{Dsd}{V_D} \quad \text{where } V_D = 15,000' / \text{sec.}$$

$$Tgd = Tsd + Tuh$$

$$Tcd = Tsd + Tgd$$

In a few isolated instances the holes were shot in the low velocity material overlaying the limestone formation. First arrival time vs detector distance plots were made in these instances and the delay time ΔT was then calculated using the formula.

$$\frac{1}{2} \Delta T = \frac{t_i}{2 \cos \theta} \left(1 - \frac{V_1}{V_2} \right) \quad \text{which is derived as follows.}$$



V_1 = observed velocity of material overlaying limestone (from plot)

V_2 = observed velocity of Limestone (from plot)

V_D = velocity used to correct to datum

h = distance from Es to Bw

$$\theta = \sin^{-1} \frac{V_1}{V_2}$$

$$1/2 \Delta T = \frac{h}{V_1} - \frac{h}{V_D}$$

$$= h \left(\frac{1}{V_1} - \frac{1}{V_D} \right)$$

$$\text{Now } h = \frac{t_i V_1}{2 \cos \theta}$$

and by substitution we get:

$$\begin{aligned} 1/2 \Delta T &= \frac{t_i V_1}{2 \cos \theta} \times \frac{1}{V_1} - \frac{t_i V_1}{2 \cos \theta} \times \frac{1}{V_D} \\ &= \frac{t_i}{2 \cos \theta} - \frac{t_i}{2 \cos \theta} \times \frac{V_1}{V_2} \end{aligned}$$

$$1/2 \Delta T = \frac{t_i}{2 \cos \theta} \left(1 - \frac{V_1}{V_2} \right)$$

Corrected record sections of all lines shot were produced by Canadian Magnetic Reductions Ltd. from data supplied by Heiland.

Data on Time Expended

Party 105 worked fourteen days on the project and spent five days moving into the area and setting up camp.

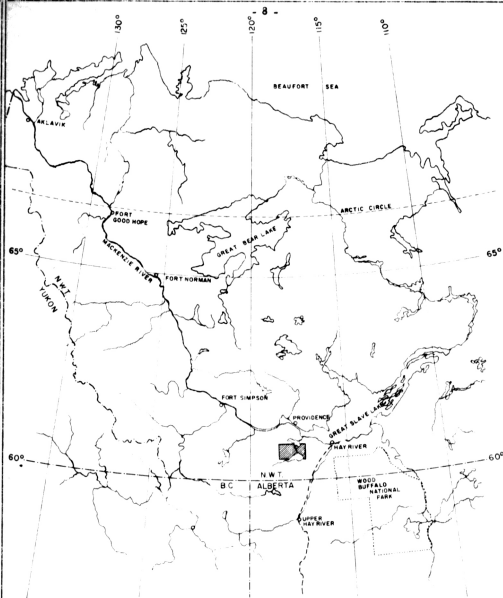
Party 108 spent three days moving in and out of the project and worked ten days in the field.

The crew consisted of four office personnel, fourteen men in the field, and three camp employees.

Supervision

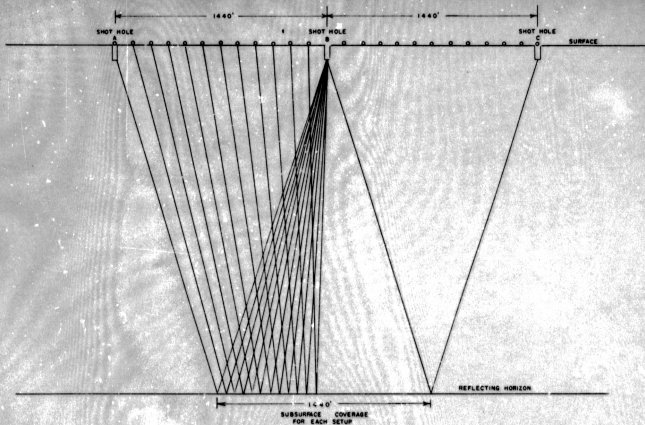
Mr. J. A. Legge, Jr., a geophysical consultant with offices in Calgary, Alberta was supervisor on behalf of New D. Todd Briggs Account and kept in close touch with the progress of the work by visits to the site of operations. Weekly and monthly reports were mailed to Mr. Legges office, and bi-weekly telegraph reports were dispatched from the field offices by radio.

Supervision on behalf of Heiland Exploration was carried out by Mr. James Barron who maintained close contact with the field crew while the work was being carried out.

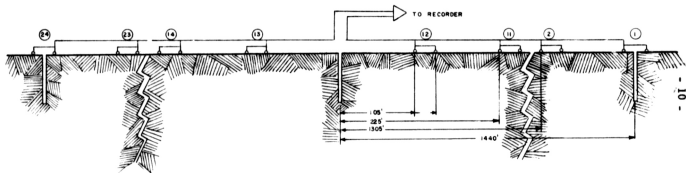


LOCATION PLAT
WEST TATHLINA LAKE AREA
NORTHWEST TERRITORIES
CANADA

AREA SHOT 



○ SYMBOL FOR DETECTOR GROUP
FOR DETAILS OF GROUP SEE
DIAGRAM ON DETECTOR SPREAD



- 10 -

DETECTOR SPREAD DIAGRAM
2 GEOPHONES PER TRACE

WEST TATHLINA LAKE AREA

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
600	525306 525307 525308	
601	525336 525309 525337 525310	511314 511314
602	525311 525312	511313
603	525313 525314	511312
604	525315	511311
605	525316	511310
606	525317	511309
607	525319	511308
608	525320 525321	511307
609	525322 525323	511306
610	525324	511305
611	525325 525326 525598	511304 511343
612	525327 525328 525329 525351	511303 511341
613	525330 525331	511302
614	525332 525334 525335	511301

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
615	525338	511315
616	525339	511316
617	525343 525344	511322
618	525342	511323
619	525340 525341	511324
620	525345	511321
621	625346	511320
622	525347 525348	511319
623	525349 525350	511318
624	525551 525552	511317
625	525553 525554	511325
626	525555 525556	511326
627	525557 525558	511327
628	525559 525560	511328
629	525561	611329
630	525563 525564	511330
631	525565	511331
632	525566	511332
633	525567	511333
634	525568 525569	511334

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
635	525570 525571	511335
636	525572	511336
637	525573	511337
638	525574	511338
639	525574	511339
640	525576 525577	511340
641	525578	511417
642	525579	511416
643	525580	511415
644	525581 525582	511414
645	525583	511413
646	525584 525378	511412 511430
647	525585 525376	511411 511428
648	525586 525374	511410 511426
649	525587 525372	511409 511424
650	525370 525588	511422 511408
651	525368 525589 525365	511420 511407
652	525590 525591 525363 525364 525366	511406 511418

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
653	525592	511405
654	525593	511404
655	525594 525595	511403
656	525596	511402
657	525599 525600	511342
658	525352	511401
659	525353	511350
660	525354	511349
661	525355	511348
662	525356 525357	511347
663	525348	511346
664	525359 525360	511345
665	525361 525362	511344
666	525377	511429
667	525375	511427
668	525373	511425
669	525371	511423
670	525369	511421
671	525367	511419
672	Not shot	
673	Not shot	
674	Not Shot	

<u>S.P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
675	530513 530514 530515 530516	545745
676	530517 530518 530519 530520 530521	545746
677	530522 530523 530524	545747
678	530525 530526 530527	545748
679	530528 530529 530530	545749
680	530531 530532 530533	545750
681	530534 530535	545751
682	530536	545752
683	530537 530538	545744
684	530540	545743
685	530541	545742
686	530542	545741
687	530543	545740
688	530544	545739
689	530545	545739
690	530546	545737
691	530547	545736

<u>S. P. #</u>	<u>Field Tape</u>	<u>Transfer Tape</u>
692	530548	545735
693	530549	545734
694	530550	545733
695	530551	545732
696	530552	545731
697	530553	545730
698	530554 530555	545729
699	530556	545728
700	530557	545727
701	530558	545726
702	530559	545725
703	530560	545724
704	530561	545723
705	530562	545722
706	530563	545721
707	530564	545720
708	530565	545719
709	530566	495519
710	530567	495518

WEST TATHLINA LAKE AREA

Legend

c - clay
 ss - sandstone
 b - boulders
 g - gravel
 s - sand
 m - muskeg
 sh - shale
 ls - limestone
 pf - perma-frost

<u>Shot Point</u>	<u>Log</u>
600	0 - 20 c, 20 - 50 ls
601	0 - 24 c and b, 24 - 40 ls
602	0 - 15 c and b, 15 - 50 ls
603	0 - 40 ls
604	0 - 5 c, 5 - 50 ls
605	0 - 20 c and b, 20 - 40 ls
606	0 - 22 c and b, 22 - 40 ls
607	0 - 15 c and b, 15 - 40 ls
608	0 - 28 c and b, 28 - 50 ls
609	0 - 15 c and b, 15 - 45 ls
610	0 - 20 c and b, 20 - 35 c and ss, 35 - 50 ls
611	0 - 10 c and b, 10 - 40 ls
612	0 - 15 c and b, 15 - 40 c and ls, 40 - 50 ls
613	0 - 10 c and b, 10 - 50 ls
614	0 - 20 c and b, 20 - 50 ls
615	0 - 30 c and ls, 30 - 40 ls
616	0 - 10 m, 10 - 15 c, 15 - 40 ls
617	0 - 10 c, 10 - 40 ls

Shot PointLog

618	0 - 10 in, 10 - 40 ls
619	0 - 30 c and b, 30 - 40 ls
620	0 - 10 c and b, 10 - 40 ls
621	0 - 15 c and b, 15 - 40 ls
622	0 - 15 c and b, 15 - 40 ls
623	0 - 40 c and g, 40 - 50 ls
624	0 - 15 c and b, 15 - 35 c and ls, 35 - 50 ls
625	0 - 35 c and b, 35 - 45 ls
626	0 - 15 c, 15 - 30 c and ls, 30 - 40 ls
627	0 - 25 c and b, 25 - 40 ls
628	0 - 10 c, 10 - 40 ls
629	0 - 40 c and ls, 40 - 50 ls
630	0 - 25 c and g, 25 - 40 ls
631	0 - 45 c and b, 45 - 55 ls
632	0 - 30 c, 30 - 40 ls
633	0 - 20 c and b, 20 - 40 ls
634	0 - 30 c, s and b, 30 - 40 ls
635	0 - 25 c and b, 25 - 40 ls
636	0 - 25 c and ls, 25 - 40 ls
637	0 - 30 c and ls, 30 - 40 ls
638	0 - 20 c and b, 20 - 40 ls
639	0 - 10 c, 10 - 30 ls (fragmental) 30 - 40 ls
640	0 - 40 c and b, 40 - 50 ls
641	0 - 15 c and b, 15 - 40 ls
642	0 - 30 m and c, 30 - 40 ls

Shot PointLog

643	0 - 20 m and s, 20 - 40 ls
644	0 - 45 c and b, 45 - 55 ls
645	0 - 25 c and b, 25 - 40 ls
646	0 - 30 c and s, 30 - 40 ls
647	0 - 20 c and b, 20 - 40 ls
648	0 - 25 c and b, 25 - 40 ls
649	0 - 35 c and b, 35 - 45 ls
650	0 - 10 m, 10 - 20 c and g, 20 - 40 ls
651	0 - 15 m and pf, 15 - 30 c, 30 - 40 ls (fragmental)
652	0 - 30 c, 30 - 40 ls
653	0 - 30 c, 30 - 40 ls
654	0 - 20 c, 20 - 40 ls
655	0 - 45 c and b, 45 - 55 ls
656	0 - 30 c and b, 30 - 40 ls
657	0 - 35 c and ls, 35 - 45 ls
658	0 - 30 c and b, 30 - 40 ls
659	0 - 10 g, 10 - 30 c, 30 - 40 ls
660	0 - 20 c and b, 20 - 40 ls
661	0 - 25 c and b, 25 - 40 ls
662	0 - 10 g, 10 - 30 c, 30 - 40 ls
663	0 - 25 c and g, 25 - 40 ls
664	0 - 25 c and g, 25 - 40 ls
665	0 - 20 c and g, 20 - 40 ls
666	0 - 20 c and b, 20 - 40 ls
667	0 - 20 c and b, 20 - 40 ls

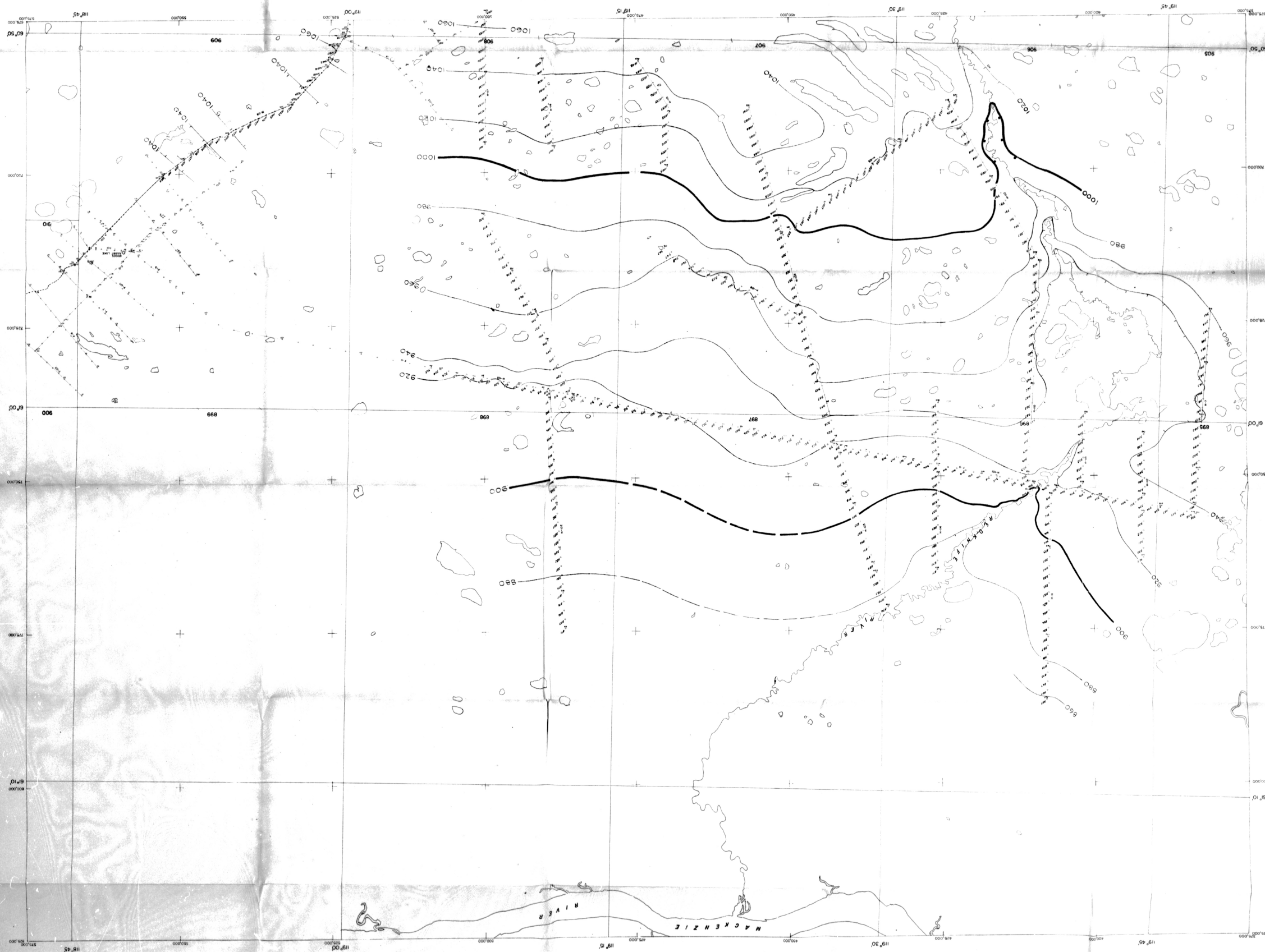
Shot PointLog

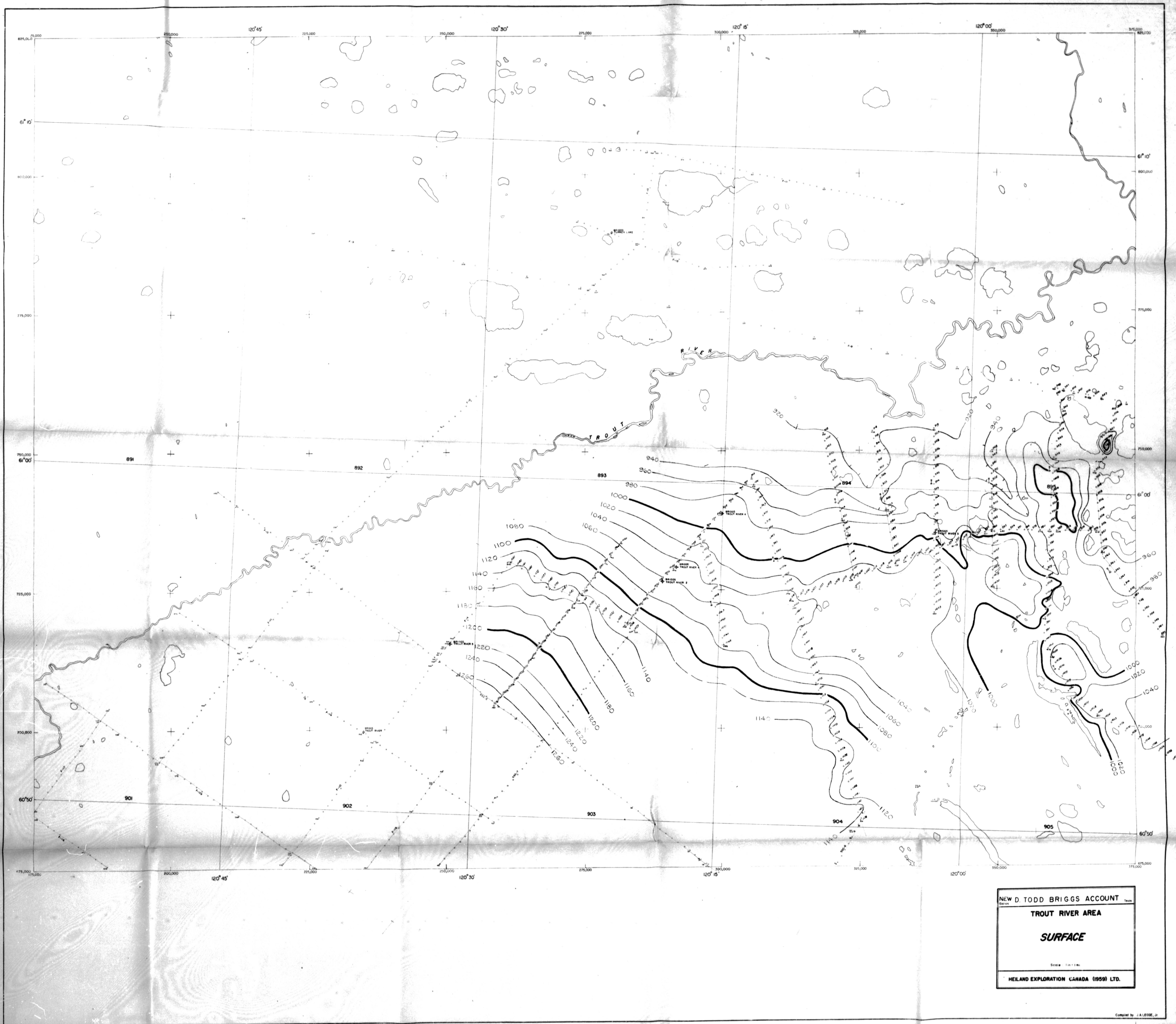
668	0 - 30 c and b, 30 - 40 ls
669	0 - 25 c and ls, 25 - 40 ls
670	0 - 30 c and b, 30 - 40 ls
671	0 - 30 m, c and g, 30 - 40 ls
672	Not drilled
673	Not drilled
674	Not drilled
675	0 - 5 m, 5 - 40 c and g
676	0 - 5 m, 5 - 40 c and g
677	0 - 5 m, 5 - 40 c and g
678	0 - 5 m, 5 - 40 c and b
679	0 - 5 m, 5 - 15 c and g, 15 - 40 g
680	0 - 20 c and b, 20 - 40 ls
681	0 - 5 m, 5 - 40 g and b
682	0 - 40 g and b
683	0 - 10 m, 10 - 20 c and b, 20 - 40 s
684	0 - 10 m, 10 - 40 c and b
685	0 - 10 m, 10 - 40 c and b
686	0 - 20 m, 20 - 30 c and b, 30 - 40 s
687	0 - 20 m, 20 - 40 c and b
688	0 - 7 m, 7 - 40 c, b and ls
689	0 - 10 m, 10 - 35 c and b, 35 - 40 ls
690	0 - 10 m, 10 - 40 c and b
691	0 - 10 m, 10 - 20 s, 20 - 40 c and b
692	0 - 20 m, 20 - 40 c and b

Shot PointLog

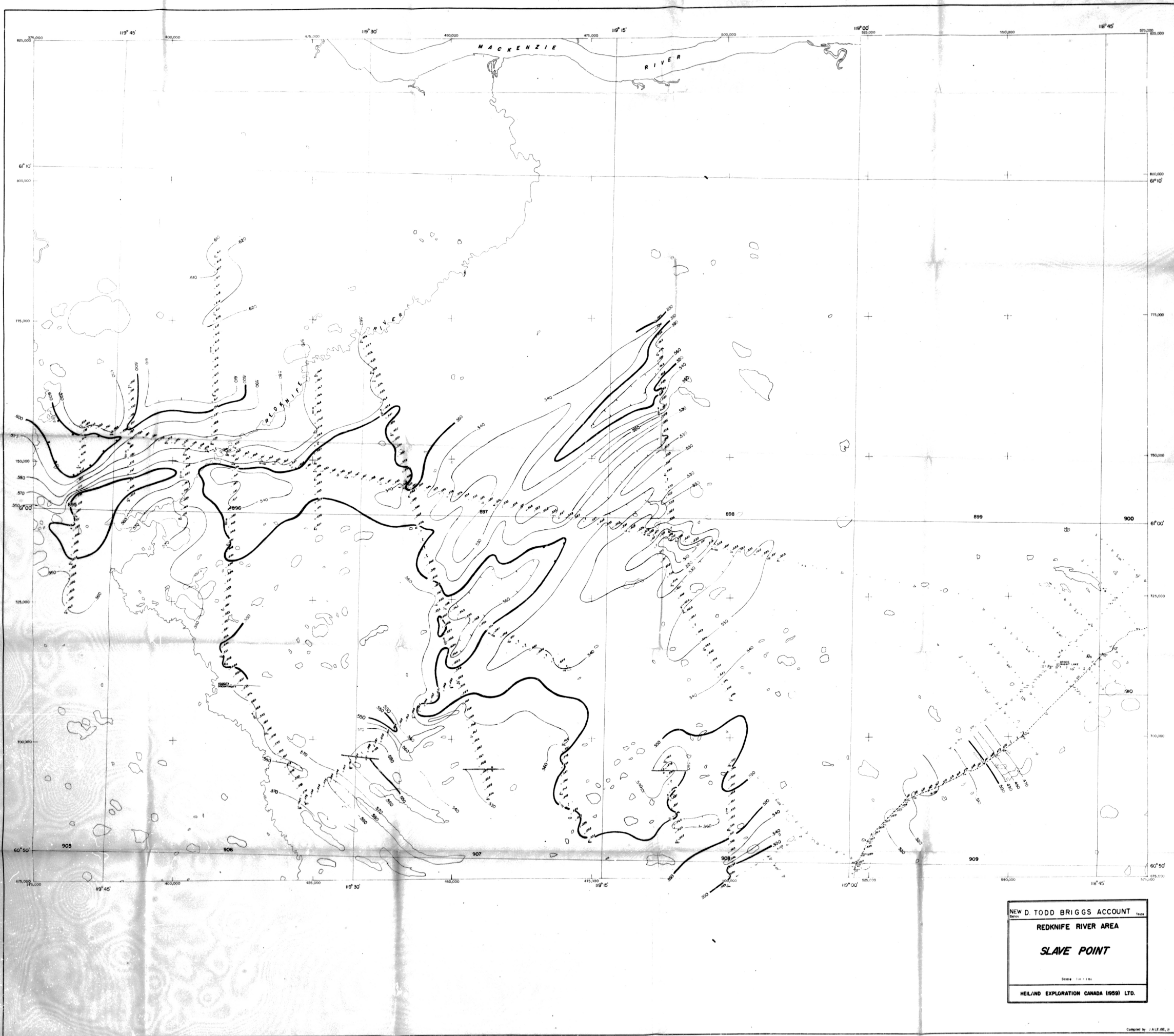
693	0 - 5 m, 5 - 40 c and b
694	0 - 10 m, 10 - 40 s and c
695	0 - 10 s and m, 10 - 40 c and b
696	0 - 15 s, 15 - 40 c and b
697	0 - 30 c and b, 30 - 40 ls
698	0 - 10 g, 10 - 40 c and b
699	0 - 5 m, 5 - 40 c and b
700	0 - 5 m, 5 - 40 c and b
701	0 - 20 c and b, 20 - 30 ss, 30 - 40 c and b
702	0 - 10 m, 10 - 40 c and b
703	0 - 5 m, 5 - 40 c, b and ls
704	0 - 5 m, 5 - 40 c, b and ls
705	0 - 5 m, 5 - 40 c, b and ls
706	0 - 5 m, 5 - 40 c, b and ls
707	0 - 5 m, 5 - 40 c, b and ls
708	0 - 5 m, 5 - 40 c, b and ls
709	0 - 5 m, 5 - 40 c, b and ls
710	0 - 5 m, 5 - 40 c, b and ls

HEILAND EXPLORATION CANADA (1959) LTD.
Scale 1:50,000
SURFACE
REDKNIFE RIVER AREA
NEW D TODD BRIGGS ACCOUNT





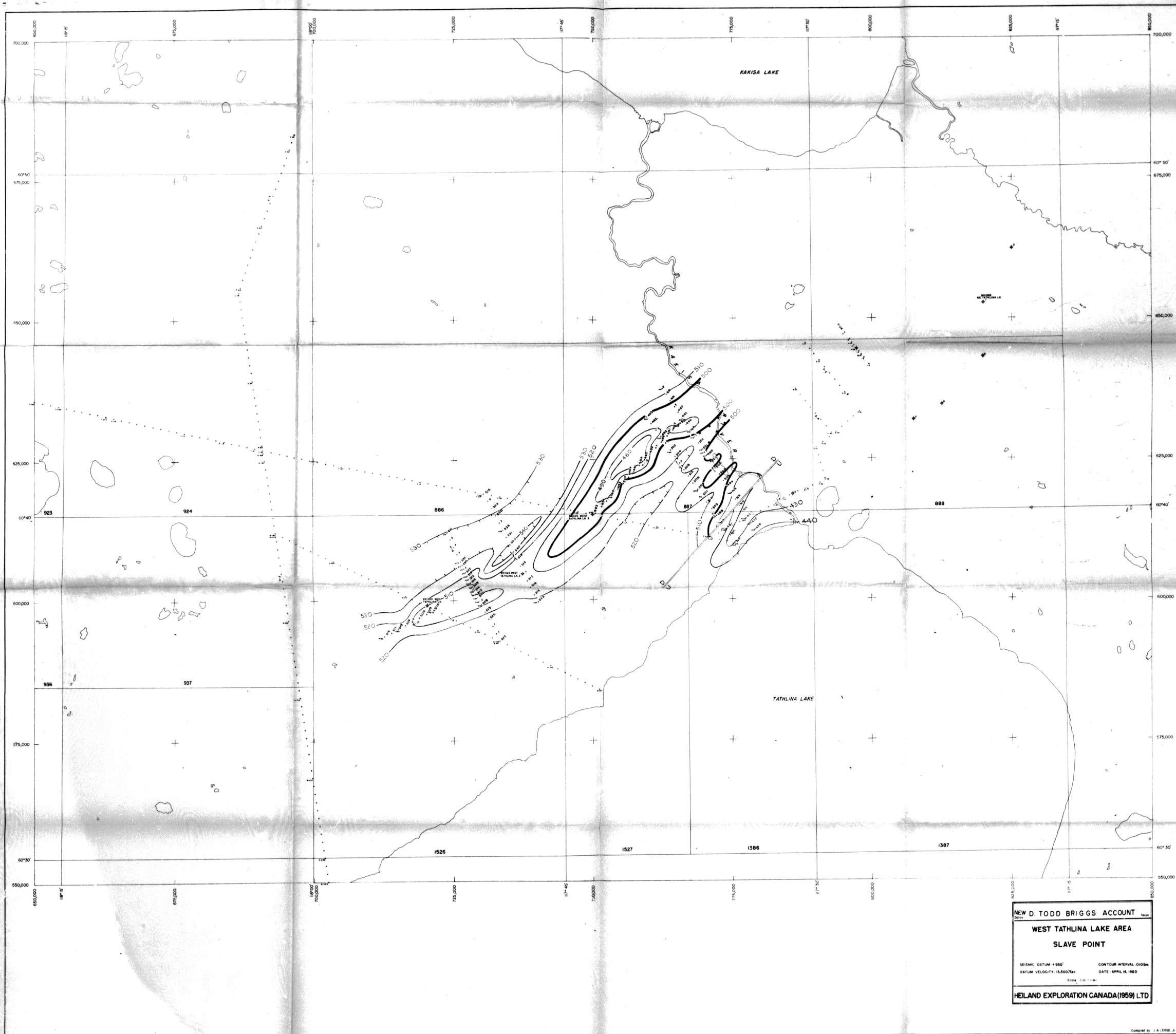
NEW D TODD BRIGGS ACCOUNT
Trout River Area
SURFACE
HEILAND EXPLORATION CANADA (1959) LTD.



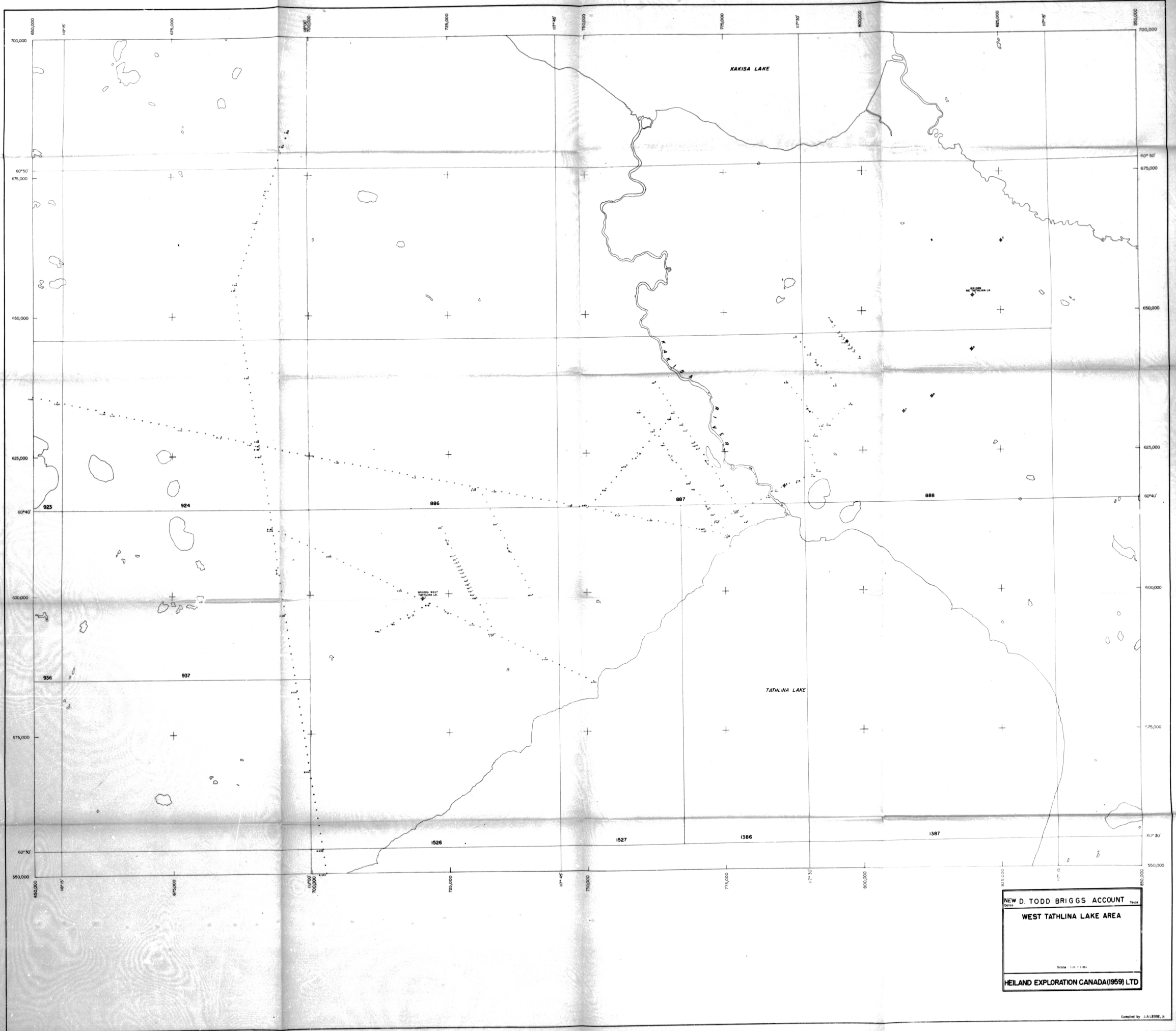
NEW D. TODD BRIGGS ACCOUNT
REDKNIFE RIVER AREA
SLAVE POINT
Scale 1:50,000
HEIL/ND EXPLORATION CANADA (1959) LTD.

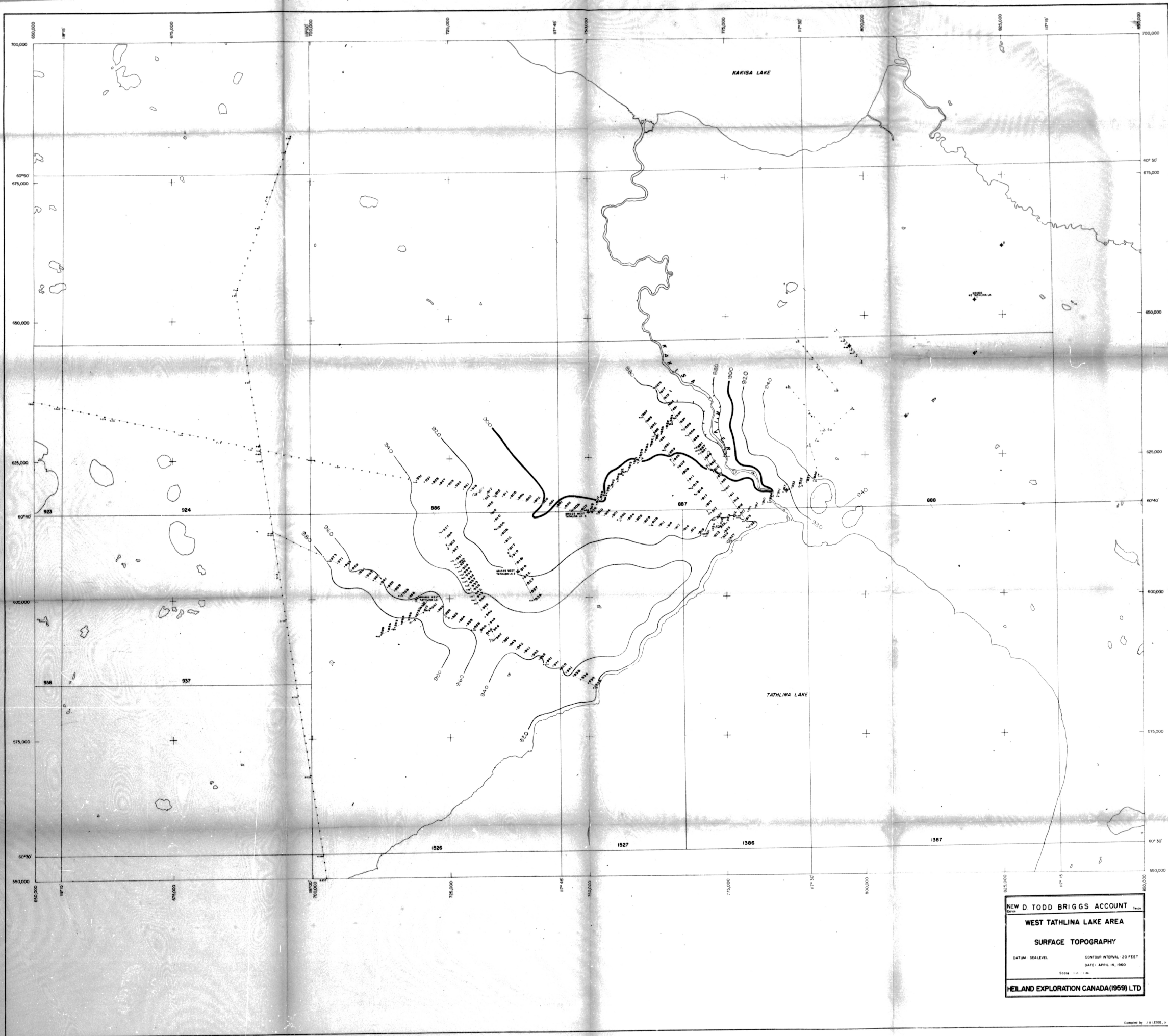


NEW D TODD BRIGGS ACCOUNT
Trout River Area
SLAVE POINT
HEILAND EXPLORATION CANADA (1959) LTD.



NEW D TODD BRIGGS ACCOUNT
WEST TATHLINA LAKE AREA
SLAVE POINT
SEISMIC DATUM - 1950' CONTOUR INTERVAL 100M
DATUM VELOCITY 13,500/Sec. DATE: APRIL 14, 1960
Scale 1:50,000
HEILAND EXPLORATION CANADA (1959) LTD





NEW D. TODD BRIGGS ACCOUNT
WEST TATHLINA LAKE AREA
SURFACE TOPOGRAPHY
DATUM: SEA LEVEL
CONTOUR INTERVAL: 20 FEET
DATE: APRIL 18, 1960
Scale 1" = 1 mi.
HEILAND EXPLORATION CANADA (1959) LTD