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ABANDONMENT OF ARCTIC WELLS PRESERVED FOR SUBSURFACE TEMPERATURE OBSERVATIONS: A STATUS REPORT

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INTERNAL REPORT 83-1

Crustal Studies
Gravity, Geothermics & Geodynamics Division
Earth Physics Branch
Department of Energy, Mines & Resources

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SUMMARY

As part of a continuing northern program of the Geothermal Service of the Earth Physics Branch, subsurface temperatures have been measured at over 128 sites in the permafrost region of Canada. Data are usually gathered at resource exploration holes in cooperation with the companies involved and the Department of Indian and Northern Affairs. At the majority of these sites, EMR has no responsibility to effect a final abandonment at the completion of the science program; however, by agreement with the regulatory bodies, the Geothermal Service is responsible for certain completion procedures at a number of these sites. Since the mid-1960's, EMR has assumed responsibility to carry out final abandonment procedures at 31 wells; 23 of these are now abandoned and most of those remaining require only a simple bullplug to be placed.

This report lists the wells for which EMR is responsible and describes in detail the six sites abandoned by Branch personnel in the 1982 field season, bringing up to date a similar report prepared in 1981 (Taylor and Judge, 1981).

CONTENTS

Introduction

The Geothermal Service is undertaking subsurface temperature measurements at many sites in northern Canada at depths greater than 125m. Data are available at over 128 sites within the permafrost region of Canada (Taylor, Burgess, Judge and Allen, 1982).

In all but a couple of cases, these data are taken at wells drilled in the course of resource exploration. While a number of mining holes have been used to obtain deep temperature measurements, most of the data comes from wells drilled for petroleum exploration. Judge and Taylor (1976) describe the preservation techniques used at many of these wells to accommodate subsequent measurements and the responsibility assumed by EMR to complete the final abandonment at some oil exploration sites, as required by the Department of Indian and Northern Affairs. At present, no responsibility has been assumed by EMR for mining holes that are used.

For most petroleum wells completed prior to 1973, a final abandonment requires the placing of a five-sack cement plug in the top 10 m of the surface casing. After 1973, a steel bullplug closing off the open hole is normally adequate (Figure 1). However, prior to abandoning a site for which EMR holds responsibility, details of the particular completion are discussed with the Department of Indian and Northern affairs.

A previous report (Taylor and Judge, 1981) outlined the status at that time of our temperature monitoring program and EMR's responsibility to abandon some of the preserved wells. This report describes the six abandonments that have been completed during the past field season and lists the eight remaining wells that EMR has responsibility to abandon at the completion of the science program.

Abandonments completed in 1982

a) Arctic Islands

Brock I-20

Hoodoo H-37

Amund Central Dome H-40

Pat Bay A-72

Gemini E-10

Five sites, two requiring cement surface plugs, were abandoned in the Arctic Islands in May, 1982, following an unsuccessful attempt in the summer of 1981. The earlier trip had been scheduled in the summer to facilitate the cement abandonments and to obtain summer site photos and surface rock samples, which would assist in our analysis. However, an unusually wet arctic summer preceeded a long stretch of bad weather and a subsequent lack of aircraft in August precluded the abandonments by EPB personnel. To increase the probability of succeeding the following year, the trip was scheduled for the arctic spring, when long stretches of good, clear weather are common. In retrospect, the somewhat greater difficulty in cementing in the cold (-20° to -30°C) weather at that time was more than offset by good weather and simplified logistics. The summer itinerary had required staging the cementing abandonments from Mould Bay (1.2 hrs to Brock) and Resolute (2 hrs to Hoodoo); in May, we were able to use Panarctic rigs drilling near Mackenzie King and Ellef Ringnes Islands as staging bases, reducing the flight time to 40 minutes or less. This is a major consideration in aircraft load/fuel planning when the possibility of poor weather at destination is high. In May, 1982, we used

Panarctic Cape Mamen F-24 as a base for Brock, picking up 130 litres of hot water for use with the cement; Panarctic Sculpin E-08 was used as a base for Hoodoo.

The planning of the two cement abandonments included discussions with three oilfield service companies and the development of contingency plans to cover problems that might arise. Normally, surface plugs are placed just prior to rig release, when the wellbore temperature would be elevated due to the circulation of mud during drilling. However, in wells preserved for our extended use, temperatures of -20°C might be expected in the upper few metres in May. The choice of cement and the placement of the plug were recognized as critical to the success of the abandonments. The principal consideration was that the cement should set before it froze. The cooling of the plug from a placement temperature of a few degrees above zero was modelled in our wellbore simulation program. Depending on the parameters that had to be estimated, this program predicted about 5 to 8 hours for the plug to freeze. To extend this interval, provision was made in our strategy to preheat the casing by flaring the diesel in the well; subsequent discussion, however, with the cement company suggested this would not be necessary, and the procedure was dropped from consideration.

Lengthy telephone conversations ensued with personnel at Dowell of Canada and Halliburton Services Limited; considering the cement available at Resolute or Rea Point, we finally chose Halliburton "Permafrost" cement (white bag). Halliburton suggested testing a sample of the actual cement to be used; a 10 kg pail was sent from Resolute beforehand to their Calgary lab. Unfortunately it appeared that the wrong cement was sent from Resolute, so the tests were of no value.

The installation of steel bullplugs at the three other sites was routine. Description and photos are given in Appendix 1. An attempt was made to abandon Neil O-15; however, a quantity of gravel had been bulldozed around the wellhead at rig release, and although the well and valve can be opened easily for logging, the valve assembly cannot be rotated for removal due to the gravel obstruction. The abandonment hardware was left above the valve (see pictures in Appendix 2) rather than below as required by the regulations (Figure 1). A short nipple section was included to raise the sign to make it more visible from the air in this deep snow area. Picks and shovels will be taken on the next logging trip to remove some of the frozen material so that the bullplug can be placed properly.

A very deep and extensive snow field was found again to cover the Louise wellsite. A landing was not made but there was evidently little change since the area was investigated in 1980. The location was confirmed by comparing the snow-exposed rock pattern on the face of the cliff overhanging the wellsite to photos taken on logging trips in the mid-1970's.

b) Mackenzie Delta and Region

Sadene D-02

Only the Mobil Sadene D-02 (File #281) well was abandoned in the western Arctic in 1982. The abandonment was a routine one involving the installation of a bull-plug and suitable couplings on the riser. Additional natural plugs of ice exist in the casing at 45 m and 244 m which have restricted logging. Two wells remain to be abandoned as the specific responsibility of Earth Physics. Of these the Horton River G-02 site (#77) will be used as a

long-term monitoring experiment on convective overturn and the North Ellice J-23 (#271) site, which strictly requires only a bull-plug, may be abandoned with a cement plug because of the non-standard pipe used in the well-head completion.

To summarize, of the 31 wells for which EMR accepted responsibility for final abandonment since the 1960's, 23 have been abandoned by August, 1982. (Table 1, part 1). Of these, responsibility for seven abandonments was assumed by the companies involved, usually a result of a blockage developing that prevented adequate logging (e.g. EPB file numbers 87, 97, 98, 174). Four were abandoned through contracts let to nearby general contractors ($9415). The remaining twelve were completed by EPB personnel during routine logging trips. In these cases, the cost is usually no more than the hardware required, if the aircraft expenses and personnel time are assigned to our routine data acquisition budgets. We might note here that the cost of preserving wells in the Arctic for our temperature measuring program has exceeded final abandonment costs by far. Figure 1 in the earlier report (Taylor and Judge, 1981) compares the two costs over the years and may be considered for all practical purposes to be a current picture.

Of the 23 sites now abandoned, 14 yielded a fully satisfactory data set. Blockages or surface completion damage at six sites (55, 87, 97, 98, 100 and 258) terminated our measurements prematurely or greatly reduced the logging depth. No data was obtained at three sites (EPB file numbers 90, 93 and 174).

Abandonments remaining to be done

Table 1, part 2, lists the 8 wells for which the Branch has a continuing responsibility eventually to abandon. Locations are shown in Figure 2. Only

one requires a cement plug, although North Ellice J-23 may be abandoned more easily with cement than with a bullplug. All the couplings and other fittings have been purchased.

At this time, very limited trips purely for logging are planned for 1983 because of CESAR; however, it should be possible to finish this abandonment program by the 1984 field season, leaving the Reindeer and Horton sites for long term monitoring. Garnier must be abandoned in the summer, as must Louise (in order to find) and North Ellice. We do not expect any particular problem with completing this program and the expense should be negligible if abandonments are effected when in the areas for routine logging. All flying normally is covered by our PCSP allotment.

Acknowledgements

Logistic support and aircraft time for field work has been provided by PCSP. We thank Bill Presley, of PCSP Resolute, for assistance with the cement abandonments, and especially for organizing oxy-acetylene equipment etc. to cover unexpected contingencies at these sites. Lengthy technical discussions were held with Ralph Lich (Lynes Limited Services), Richard Marcinew (Dowell of Canada) and Mike Richardson (Halliburton Services Limited).

Bibliography

1) General

Judge, Alan and Taylor, Alan. 1976.

Preservation of arctic wells for subsurface temperature observations. Geothermal Service of Canada, Internal report 76-1.

Judge, Alan. 1978.

Preservation and Abandonment of Northern Wells. Memo to Dr. M. J. Berry, May 15, 1978 (file 6210-5).

Taylor, Alan and Judge, Alan. 1981.

Abandonment of arctic wells preserved for subsurface temperature observations: a status report. Geothermal Service of Canada, Internal Report 81-4.

2) Northern Data Collections

Taylor, A.E. and Judge, A.S. 1974.

Canadian Geothermal Data Collection - Northern Wells, 1955 to February 1974. Geothermal Series Number 1, Earth Physics Branch, EMR, 171 p.

Taylor, A.E. and Judge, A.S. 1975.

Canadian Geothermal Data Collection - Northern Wells, 1974. Geothermal Series Number 3, Earth Physics Branch, EMR, 127 p.

Taylor, A.E. and Judge, A.S. 1976.

Canadian Geothermal Data Collection - Northern Wells, 1975. Geothermal Series Number 6, Earth Physics Br., EMR, 142 p.

Taylor, A.E. and Judge, A.S. 1977.

Canadian Geothermal Data Collection - Northern Wells, 1976-77. Geothermal Series Number 10, Earth Physics Branch, EMR, 194 p.

Judge, A.S., Taylor, A.E. and Burgess, M. 1979.

Canadian Geothermal Data Collection - Northern Wells 1977-78.

Geothermal Series Number 11, 187 p.

Judge, A.S., Taylor, A.E., Burgess, M. and Allen, V.S. 1981.

Canadian Geothermal Data Collection - Northern Wells 1978-80.

Geothermal Series Number 12, 190 p.

Taylor, A.E., Burgess, M., Judge A.S. and Allen, V.S. 1982.

Canadian Geothermal Data Collection - Northern Wells 1981.

Geothermal Series Number 13, 153 p.

FINAL ABANDONMENT OF TEMPERATURE OBSERVATION WELLS

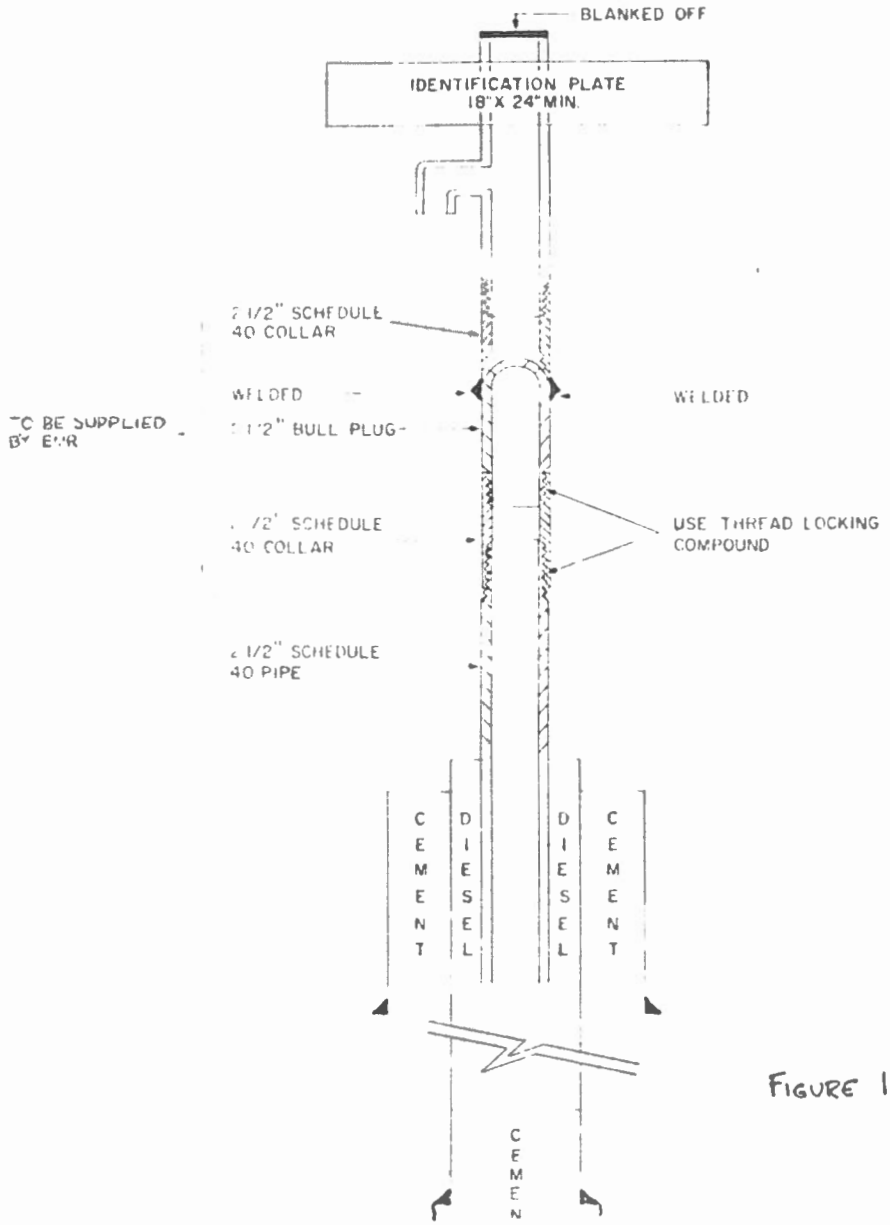


FIGURE 1.

FIGURE 2. Location of sites that EMR holds responsibility to abandon. Open symbol, bullplug required; Closed symbol, cement plug required.

LIST OF WELLS FOR WHICH E.M.R. HAS

ACCEPTED RESPONSIBILITY FOR

FINAL ABANDONMENT

1) ABANDONMENTS COMPLETED

EPB File No.	Name of Well	Abandonment Details
55	Lobitos et al Resolute L-41	EPB contract, 1977 ($2415)
62	Socony Mobil N. Cath B-62	EPB personnel, 1970 (cost about $2000)
70	IOE Providence A-47	EPB personnel, 1970 (cost about $1000)
76	CPOG Kugaluk N-02	by company
86	Panarctic Hoodoo H-37	EPB personnel, 1982 ($150, note 3)
87	Elf Wilkins E-60	Company responsibility, (letter from Robertson September 17/74; see Appendix 2 of Internal Report 81-4).
89	Shell Beaverhouse H-13	by company
90	Panarctic Amund Central Dome H-40	EPB personnel, 1982 ($100, note 3)
91	Elf Jameson Bay C-31	by company (note 1)
93	Panarctic et al Cornwallis Central Dome K-40	EPB personnel 1980 ($1000, note 4)
94	Candex et al Dahadinni M-43A	EPB contract, 1977 ($1700)
95	Aquitaine et al Rowley M-04	EPB personnel 1980 ($1400, note 4)
97	Panarctic Fosheim N-27	by company (note 2)

98	Elf et al Storkerson A-15	Company responsibility (letter from Robertson, Sept. 17/74)
100	Arco Clarke et al Hume River D-57	EPB contract, 1977 ($2650)
151	Arco West Whitefish H-34	EPB contract 1977 ($2650)
158	Panarctic Brock I-20	EPB personnel, 1982 ($150, note 3)
168	Panarctic Dundas C-80	EPB personnel 1980 ($100, note 3)
174	Highland Lake I-23	Company responsibility (letter from Chizelle, July 12, 1973; see Appendix 2 of Internal Report 81-2).
175	Gemini E-10	EPB personnel, 1982 ($100, note 3)
258	Panarctic Pat Bay A-72	EPB personnel, 1982 ($100, note 3)
276	Shell Ulu A-35	EPB personnel, 1978 ($100, note 3)
281	Mobil Gulf Sadene D-02	EPB personnel, 1982 ($100, note 3)

NOTES

1. Observed cemented to surface during logging trip of 1976.

2. By agreement, EPB cable remains through the cement plug. Cable failed shortly after installation.

3. Abandonments by EPB personnel done normally during routine temperature logging; cost represents any material used, such as couplings and bullplugs, or cement.

4. As for note 3. Special trip from Ottawa required to these jobs in summer conditions. Inclues share of $800 airfare and $1000 salary estimate.

2) REMAINING TO BE ABANDONED

EPB File No.	Name of Well	Hardware Required	Status
63	BA Shell 10E Reindeer D-27		A (note 1)
77	Elf Horton River G-02	cement plug	A (note 2)
92	Panarctic Garnier O-21	install sign	R (note 3)
169	Panarctic Louise Bay O-25	2-2" NPT coupling 1-2" NPT bullplug	R
197	Gulf WC et al Neil O-15	2-3" NPT coupling 1-3" NPT bullplug presently on well (see Appendix 2)	R
257	Panarctic et al Pedder Pt. D-49	2-2 1/2" SCH 80 coupling 1-2 1/2" Bullplug, 8 threads per inch	A
271	SOBC Can. Sup. et al North Ellice J-23	cement or welded bullplug	R
291	Panarctic Cornwall O-30	2-2" NPT coupling 1-2" NPT bullplug	A

A = active measurement site

R = measurements complete, ready to be abandoned.

NOTES

1. Extended term measurement site. Gulf carried out considerable additional rectification work in 1976. Letter from Blue, Oct. 2/74. Site visited by EPB in July 1981, November 1981, and July 1982. See pictures in Appendix 2 and letters in Appendix 3.

2. Tentative plans are to install an automatic temperature recorder to monitor convective overturn.

3. Company well completion discovered cut below ground surface subsequent to their abandonment. Letter from Hood, Aug. 27/80. Well casing filled with about 600m frozen drilling mud. See appendices of Internal Report 81-4.

APPENDIX 1

Well abandonment reports for sites completed in 1982

Brock I-20

Hoodoo H-37

Amund Central Dome H-40

Pat Bay A-72

Gemini E-10

Sadene D-02

WELL ABANDONMENT REPORT

WELL: Panarctic Brock I-20

LOCATION: 77°59.7'N 114°33.9'W

ELEVATION: 16 m

SPUD: 1972 April 14

RIG RELEASE: 1972 June 28

SUBSEQUENT MEASUREMENTS BY EARTH PHYSICS BRANCH: Five temperature logs to 840m, four of which are published in

Taylor, A.E. and Judge, A.S. 1977

Canadian Geothermal Data Collection - Northern Wells 1977-78. Geothermal Series No. 10, Earth Physics Branch, EMR 194 p.

PERMAFROST DEPTH: 422m

ABANDONMENT BY EPB:

DATE: 1982 May 1; air temperature -30°C

TECHNIQUE: The well was logged as usual, and then opened at the upper threaded joint in the large diameter casing. The top of the diesel fuel in this casing was found to be about 3m below ground level so no fuel had to be pumped out to accommodate the plug. A plywood disc slightly smaller than the well was lowered on a string of light threaded rods and held just above the fluid surface using a pipe wrench (picture). A cement mixer was used to make a slurry, using 3 gal. water for each 80 lb. bag of Halliburton Permafrost Cement. One bag was made at a time and poured into the well. When all five bags had

been put in, the rod supporting the wooden disc and cement column was permitted to slide down a short distance to refusal, presumably when the wooden disc met the diesel surface.

The upper surface of the plug is about 0.5m below ground level; hence, the plug, consisting of 5 sacks of Permafrost cement, occupies the upper 2.5m of casing.

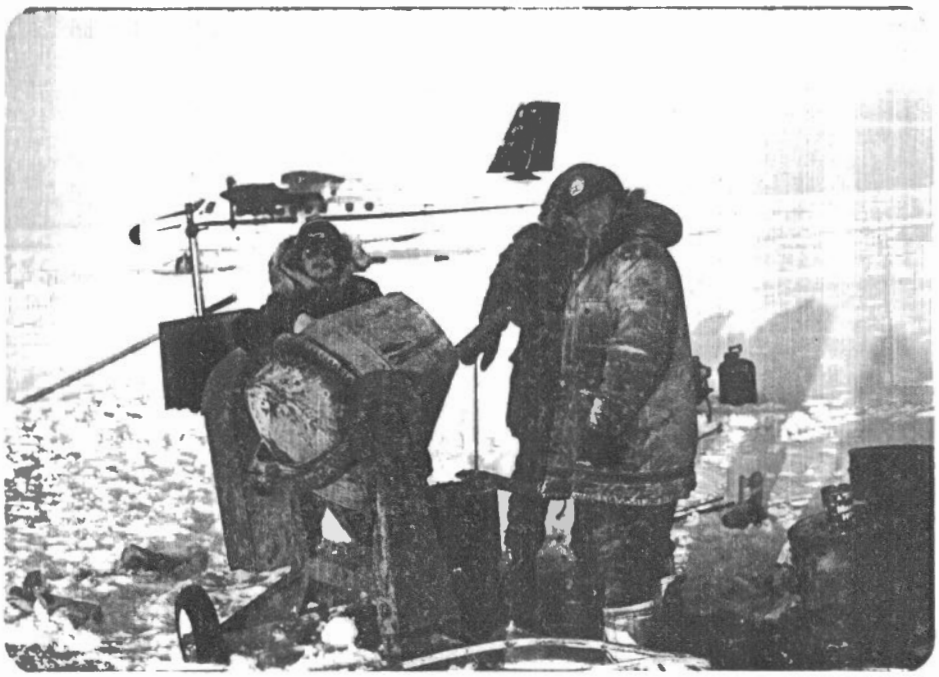
The casing and sign assembly were re-installed. The well name and location are stamped on the original steel arrow sign; the large sheet metal sign installed a number of years ago to improve visibility of the site from the air was left on the well, as shown in the picture.

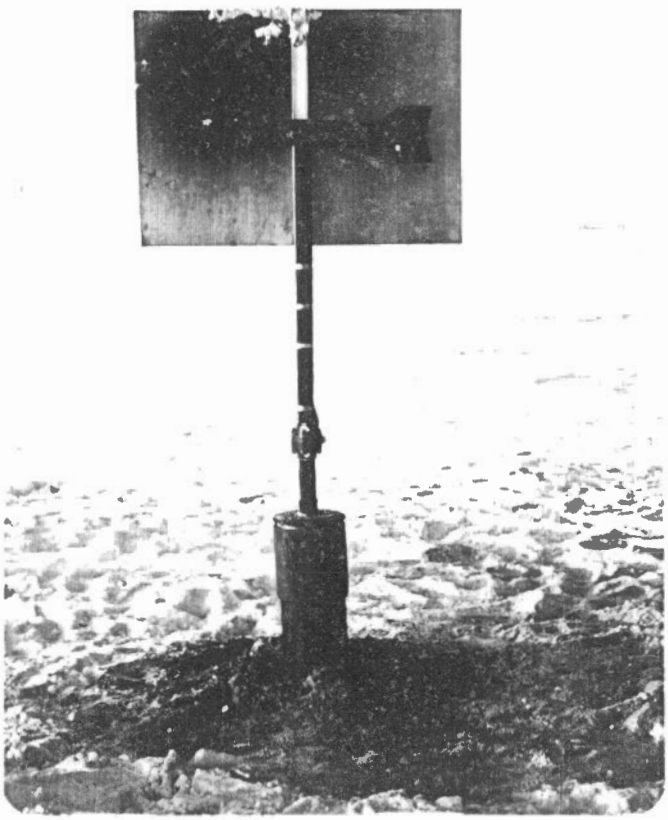
The site and general area appeared clean, as far as could be seen with the complete snow cover in May.

BROCK I-20

Placing cement surface plug at final abondonment

by Earth Physics Branch, EMR, May 1, 1982.





WELL ABANDONMENT REPORT

WELL: Panarctic Hoodoo Dome H-37

LOCATION: 78°6.5'N 99°45.6'W

ELEVATION: 156m

SPUD: 1969 Dec. 20

RIG RELEASE: 1970 August 17

SUBSEQUENT MEASUREMENTS BY EARTH PHYSICS BRANCH: Five temperature logs to 840m four of which are published in

Taylor, A.E. and Judge, A.S. 1977.

Canadian Geothermal Data Collection - Northern Wells 1977-78.

Geothermal series No. 10, Earth Physics Branch, EMR 194 p.

Fifth log (unpublished) taken at time of abandonment.

PERMAFROST DEPTH: 303m

ABANDONMENT BY EPB:

DATE: 1982 May 2; air temperature -30°C

TECHNIQUE: The well was logged as usual and then opened at the upper threaded joint in the large diameter casing. The top of the diesel fuel in this casing was found to be about 6 m below ground level so no fuel had to be pumped out to accommodate the plug. A plywood disc slightly smaller than the well was lowered on a string of light threaded rods and held just above the fluid surface using a pipe wrench. Cement was mixed by hand in a small drum, using 3 gal water for each 80 lb bag of

Halliburton Permafrost Cement. One bag was made at a time and poured into the well. When all five bags had been put in, the rod supporting the wooden disc and cement column was permitted to slide down a short distance to refusal, presumably when the wooden disc met the diesel surface. The upper surface of the plug is about 3m below ground level; hence, this surface plug is located from 3m to 6m below the ground surface.

The casing cap and original sign assembly was re-installed, as shown in the picture. The general appearance of the surrounding area is good.

HOODOO H-37

Site following placing of cement surface plug

by Earth Physics Branch, EMR, May 2, 1982.

WELL ABANDONMENT REPORT

WELL: Panarctic Amund Central Dome H-40

LOCATION: 78°19.5'N 96°15.8'W

ELEVATION: 63m

SPUD: 1970 November 10

RIG RELEASE: 1971 April 25

SUBSEQUENT MEASUREMENTS BY EARTH PHYSICS BRANCH: Hole found blocked near 21m depth in May 1971. Attempts to remove blockage were not successful. No temperature logs were recovered.

PERMAFROST DEPTH: Not determined

ABANDONMENT BY EPB:

DATE: 1982 May 3

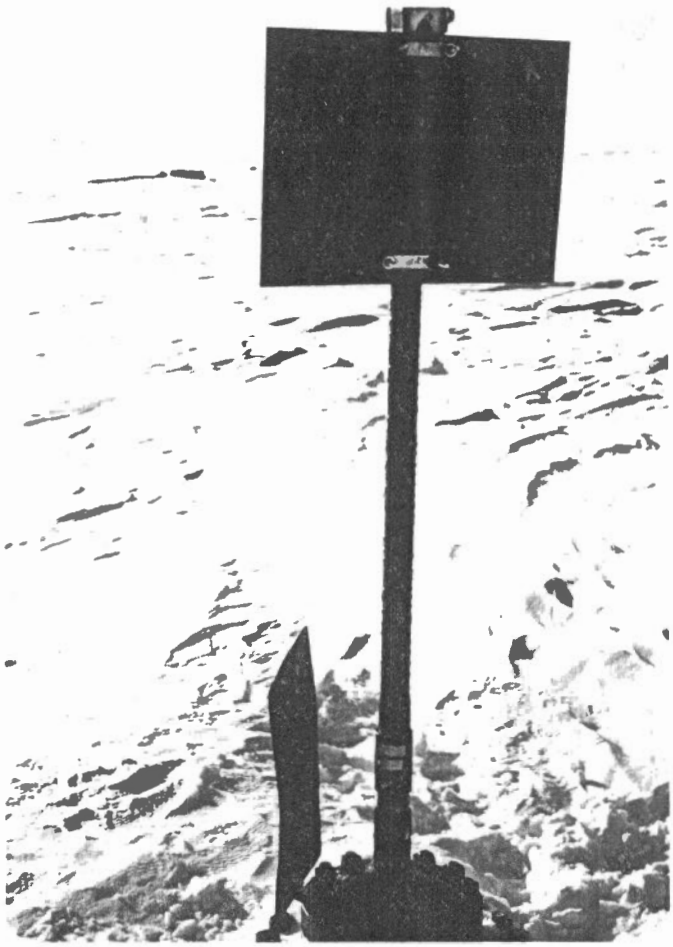
TECHNIQUE: The riser was removed from the swage and a 2 3/8" EVE coupling was installed on the swage using thread sealant (Loctite). A bullplug was threaded using sealant, into this coupling to seal the well. The riser was threaded into a coupling previously welded to the head of the bullplug (see picture and compare Figure 1).

A sign, prepared by EPB, was bolted to the riser. Snow cover permitted only a cursory assessment of the site, but a dozen or so barrels are near the well (see picture, to left of sign).

AMUND CENTRAL DOME H-40

Position of steel bullplug (into coupling on swage)

at final abandonment by Earth Physics Branch, EMR, May 3, 1982.



WELL ABANDONMENT REPORT

WELL: Panarctic Pat Bay A-72

LOCATION: 77°21.0'N 105°27.0'W

ELEVATION: 17m

SPUD: 1975 Oct. 28

RIG RELEASE: 1975 May 4

SUBSEQUENT MEASUREMENTS BY EARTH PHYSICS BRANCH: Five temperature logs over seven years. The first log was taken to 488m about 2 weeks after rig release. Subsequent visits found the well blocked at 163 m and thereafter only shorter logs are available. Four logs are published in:

Judge, A.S., Taylor, A.E., Burgess, M., Allen, V.S. 1981. Canadian Geothermal Data Collection - Northern Wells, 1978-80. Geothermal Series Number 12, Earth Physics Branch, EMR, 190 p.

PERMAFROST DEPTH: greater than 300 m

ABANDONMENT BY EPB:

DATE: 1982 May 3

TECHNIQUE: In attempting to clear the blockage, a 5 kg weight on wireline had been stuck in the casing. Attempts to pull the weight back failed so the line was cut and the weight remains stuck around 163m.

To abandon, the valve was removed and replaced by a 3" NPT coupling, using a thread sealant. A bullplug was threaded into this coupling to seal the well (compare Figure 1). The original sign was installed in the coupling previously welded to the bullplug (see picture).

No debris is visible at this time of year although several windrows or piles of gravel are visible in the area.

PAT BAY A-72

Position of steel bullplug (into coupling on riser)

at final abandonment by Earth Physics Branch, May 3, 1982.

WELL ABANDONMENT REPORT

WELL: Panarctic Gemini E-10

LOCATION: 79°59.4'N 84°4.2'W

ELEVATION: 126m

SPUD: 1972 Oct. 14

RIG RELEASE: 1973 Mar. 15

SUBSEQUENT MEASUREMENTS BY EARTH PHYSICS BRANCH: Eight logs to 876m over nine years; seven logs published in:

Judge, A.S., Taylor, A.E., Burgess, M., Allen, V.S. 1981. Canadian Geothermal Data Collection - Northern Wells, 1978-80. Geothermal Series Number 12, Earth Physics Branch, EMR, 190 p.

The eighth log, taken at time of abandonment, is unpublished at present.

PERMAFROST DEPTH: 501m

ABANDONMENT BY EPB:

DATE: 1982 May 4

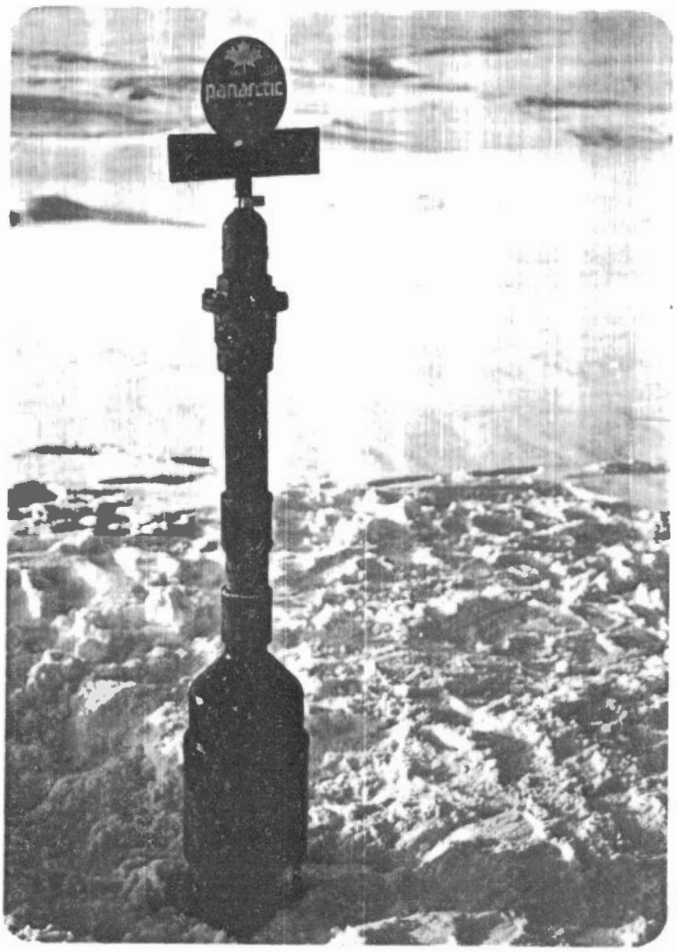
TECHNIQUE: The valve and sign assembly were removed from the swage on the larger casing. A 3" NPT coupling was screwed on the swage with Loctite pipe sealant and a bullplug similarly installed in this coupling to seal the well. The mate between the coupling welded to the bullplug and the valve/sign was achieved using a short section of nipple (see picture).

The original sign on the well gives the operator and well name only. The general site environs appears clean and level.

GEMINI E-10

Position of steel bullplug (into coupling on swage)

at final abandonment by Earth Physics Branch, EMR, May 4, 1982.



WELL ABANDONMENT REPORT

WELL: Mobile Gulf Sadene D-02

LOCATION: 68°51.0'N 126°47.3'W

ELEVATION: 233m

SPUD: 1977 March 08

RIG RELEASE: 1977 May 06

SUBSEQUENT MEASUREMENTS BY EARTH PHYSICS BRANCH: Four temperature logs; first to 429m, others to 245m, over period of 5 years. First three logs published in Judge et al. 1981. Canadian Geothermal Data Collection - Northern Wells 1978-80. Geothermal Series Number 12, Earth Physics Branch, EMR, 190 p.

PERMAFROST DEPTH: Greater than 309m

ABANDONMENT BY EPB:

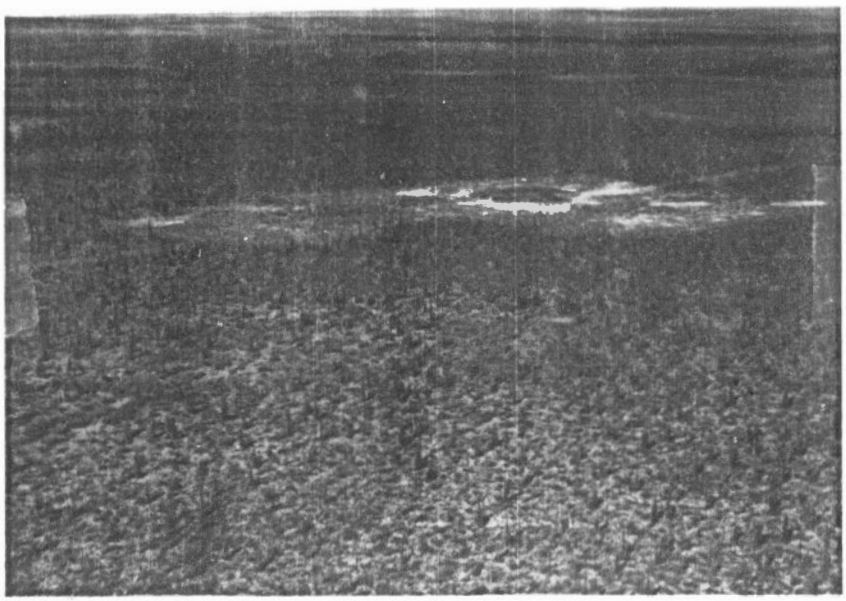
DATE: 1982 July 20

TECHNIQUE: An attempt was made to relog the well prior to abandonment but the well was found plugged at 46 m. Repeated attempts to clear were unsuccessful and the probe was found to have ice on the tip upon recovery. To complete the abandonment the valve was removed from the pipe welded to the well-head assembly. A bull-plug and welded coupling was screwed on the pipe using a thread sealant and the sign replaced on the well using a second coupling above the bull-plug. The completion is as shown in the attached photographs.

In general the site is fairly clear although several fuel drums noted on the first visit remain at the site.

SADENE D-02

Site following placement of bull-plug by EPB in July, 1982.



APPENDIX 2

Recent pictures of some sites remaining to be abandoned

Reindeer D-27

Neil O-15

REINDEER D-27

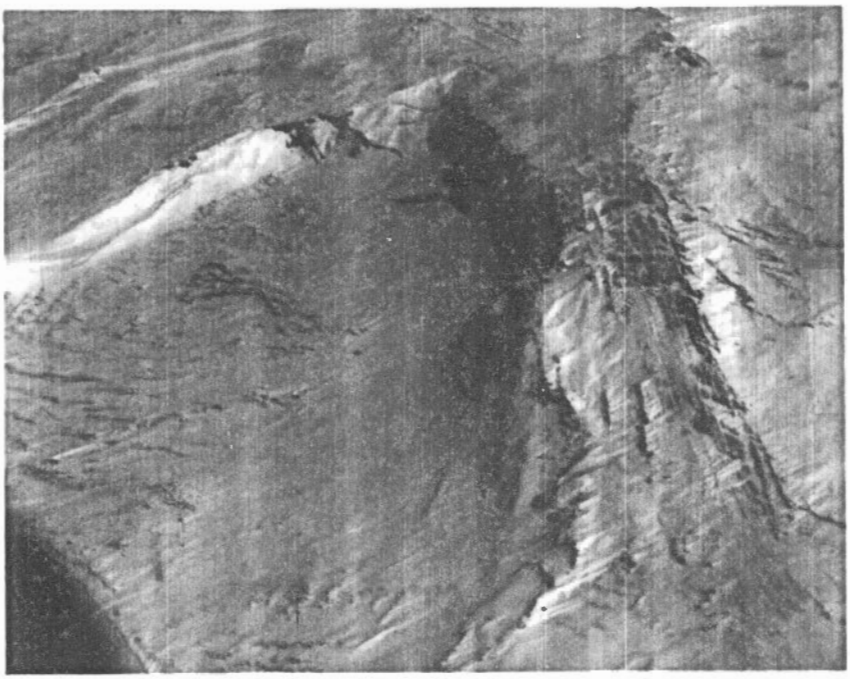
Severe erosion around site discovered in July, 1980.

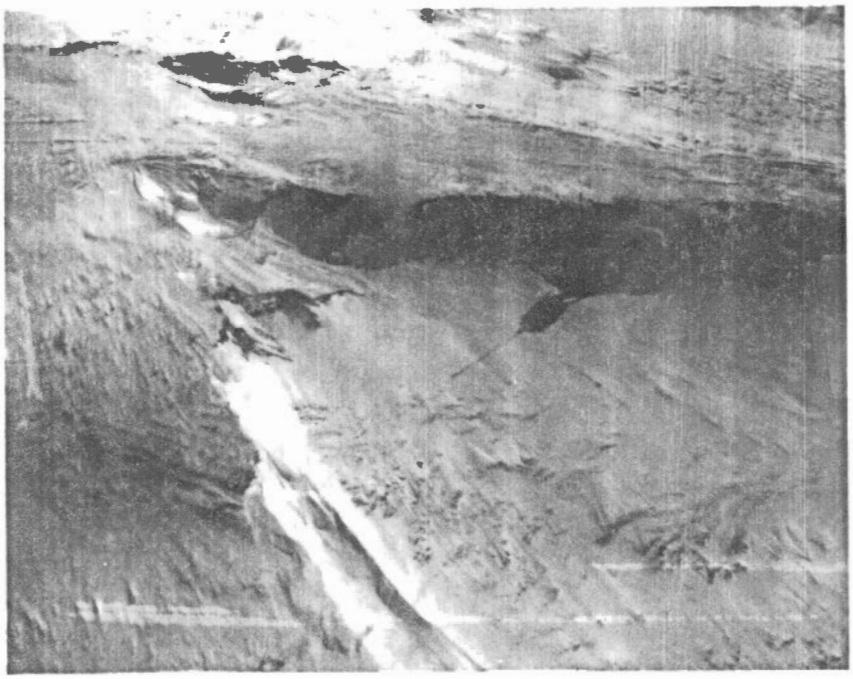
A thick ice-wedge underlies the site and is visible in all photos.

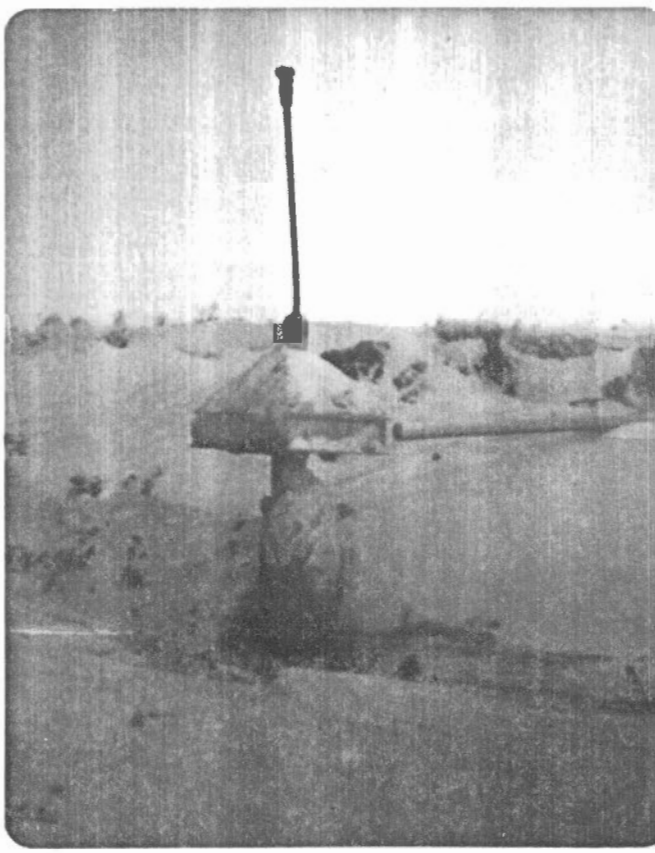
REINDEER D-27 (July 1980)

REINDEER D-27 (July, 1980)

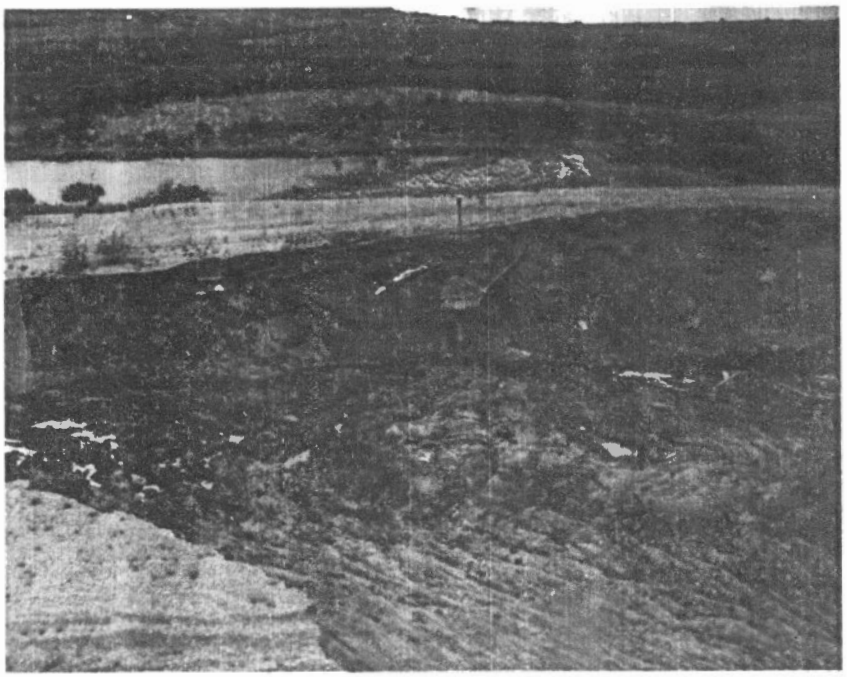
REINDEER D-27 (Spring, 1982)





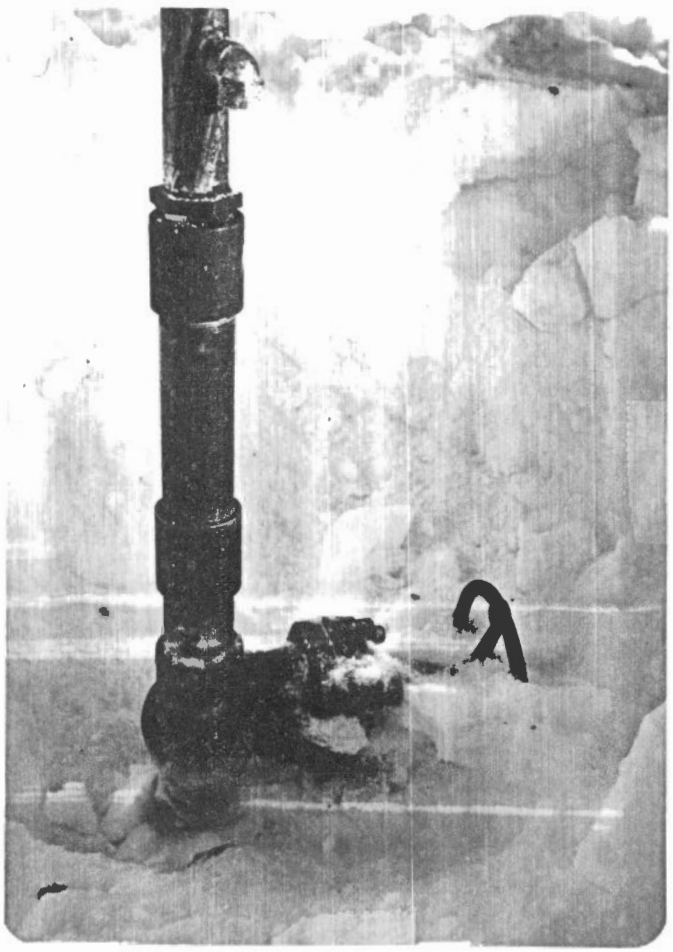


REINDEER D-27 (July, 1982)



Position of steel bullplug (immediately above large valve).

Valve frozen into ground mounded around well at rig release.



APPENDIX 3

Supporting Correspondence

Energy, Mines and Resources Canada
Science and Technology

Énergie, Mines et Ressources Canada
Science et Technologie

October 8, 1981

Mr. John Hnatiuk,
Manager, Frontier Development,
Gulf Canada Ltd.,
P.O. Box 130,
Calgary, Alberta T2P 2H7

Dear John:

I enclose here several photographs showing the slumping that occurred this summer in the vicinity of the Reindeer D-~~27~~ 27 well. As you can see the well presently sits in the back wall of the slide which presumably will undergo further degradation due to thermal erosion.

Should you plan on abandoning the well this coming winter, we would appreciate advance notice to enable us to read the cable one last time, and then remove it from the well.

With the well as a good reference point we have an ideal opportunity for careful observations on the rates of erosion etc. over the next several years. We probably should also be monitoring the thermal regime in and around the slump if we had the available manpower.

We have very much appreciated the opportunity to use the well over the past 16 years, the resulting data set is one of the best in existence and has been used in many papers to discuss the restoration of thermal equilibrium and freezeback in Arctic wells.

Best wishes.

Alan Judge
Division of Seismology
and Geothermal Studies

cc: Martin Smith

A.J:dw

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1981-11-18

Your file Votre référence

Our file Notre référence

A.E. Taylor
Division of Seismology
and Geothermal Studies
1 Observatory Crescent
Ottawa, Ontario
K1A 0Y3

Dear Al:

Re: Temperature Observation Wells

Just a note to thank you for the excellent photos and survey results from this summers program.

← D-27

It would be interesting to know what happened at the Reindeer Well to cause such severe thawing around the wellhead.

I have written to Gulf -- as a matter-of-fact, I will be starting with Gulf Canada Resources on December 1/81 and you will be able to reach me in Calgary at 233-4000.

I hope you can keep up the necessary research and monitoring of these wells and I am sure the Yellowknife C.O.G.L.A. staff will give you every assistance. Please contact Mr. A.F. (Sandy) Halcrow or Mr. H.E. (Hal) Flanders for future work.

Thanks again for your help.

Yours truly,

M.L. Smith
A/Regional Manager
Oil & Gas Section

MLS/ah

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