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Geophysical Survey Report

covering

Surface Pulse EM Surveys

over the

Montcalm Project

for

Pacific North West Capital Corp.

during

March – August , 2006

by

CRONE GEOPHYSICS & EXPLORATION LTD.

Survey Area:	**Montcalm Project near Timmins, Ontario**
Survey Type:	**Surface Pulse EM Surveys**
Lines Surveyed:	**7500 N – 10300 N**
Survey Operators:	**Dan Brazeau, Rob Chapman, Wayne Pearson**
Survey Period:	**March 20th – August 31st, 2006**
Report By:	**Kevin Ralph**
Report Date:	**January, ~~2006~~ 2007**
Submitted To:	**Pacific North West Sudbury, Ontario**

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1 INTRODUCTION

Crone Geophysics and Exploration Ltd. was contracted by Xstrata Nickel (formerly Falconbridge Ltd.) and Pacific North West to conduct a Surface Pulse Time Domain Electromagnetic (PEM) survey on its Montcalm Project Area Joint Venture near Timmins Ontario. The survey was conducted over the interval of March 20th – August 31st, 2006 during which time approximately 61.2 km (some of which includes surveys onto Xstrata Nickel's Montcalm Lease) were surveyed from 5 separate transmit loops. This report outlines the geophysical work performed on the Pacific North West Capital Corp. Property, excluding the surveys performed wholly within the Claim boundaries of the Xstrata's Montcalm Lease. The appendices to this report contain page size profile plan maps, the PEM profiles, the linear profile plots, the Step Response profile plots, and the Crone Instrument Specifications.

2 PROPERTY LOCATION AND ACCESS (provided by Client)

The PFN West Timmins Project Area lies approximately 60km west of the Town of Timmins and is located in Montcalm Township. The Project area covers 35 square kilometers (26,926 ha) is adjacent to the Montcalm Ni-Cu deposit of Falconbridge Ltd. (now Xstrata Nickel). The Property is easily accessible via the well maintained, Malette bush road which is connected to provincial Highway #101, providing access to the southern part of the PFN claims. A network of logging roads and winter trails provides good access to the bulk of the property, from the north west side to the Montcalm Mine located on the northeast side.

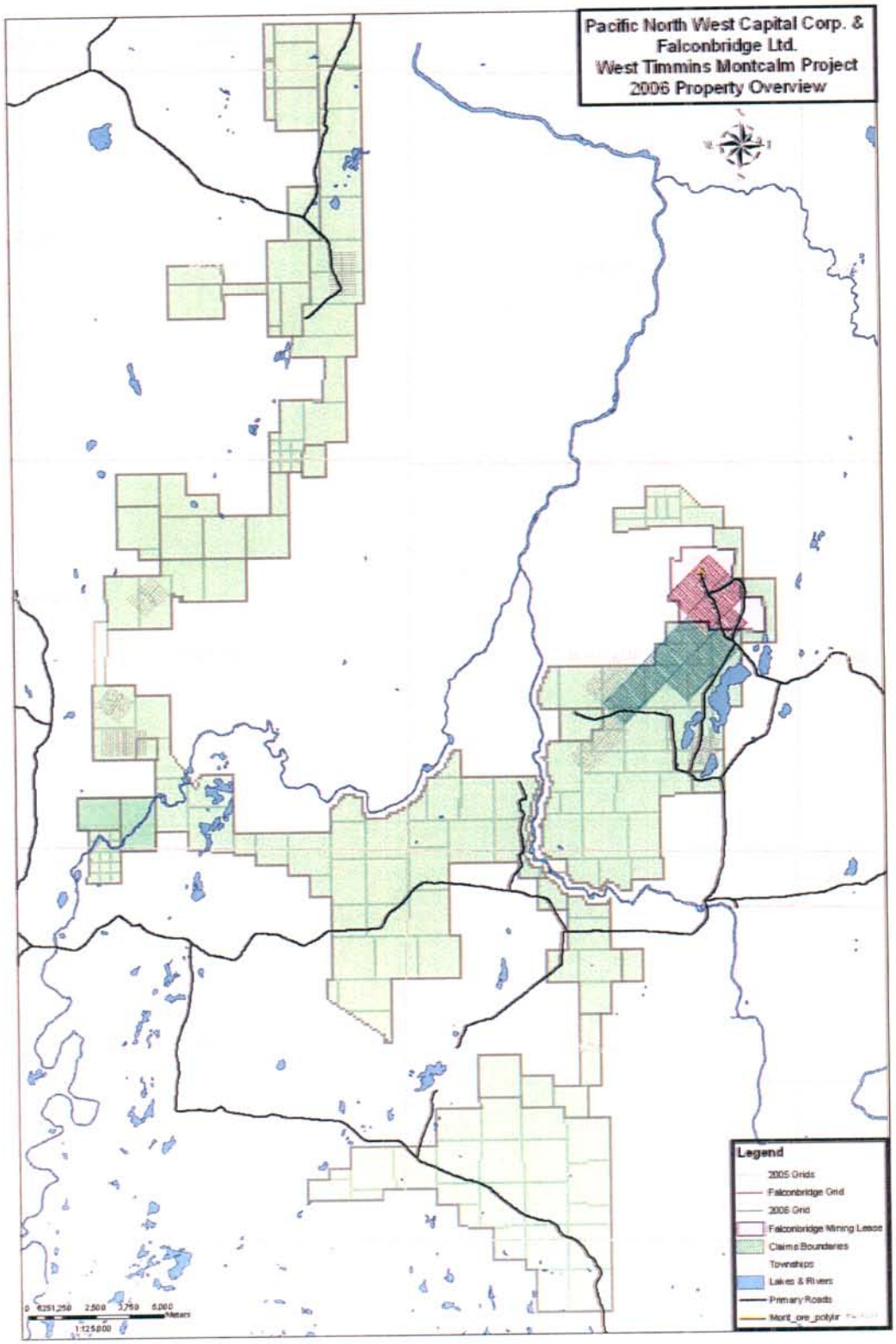


Figure 1: Montcalm Project Property Location Map

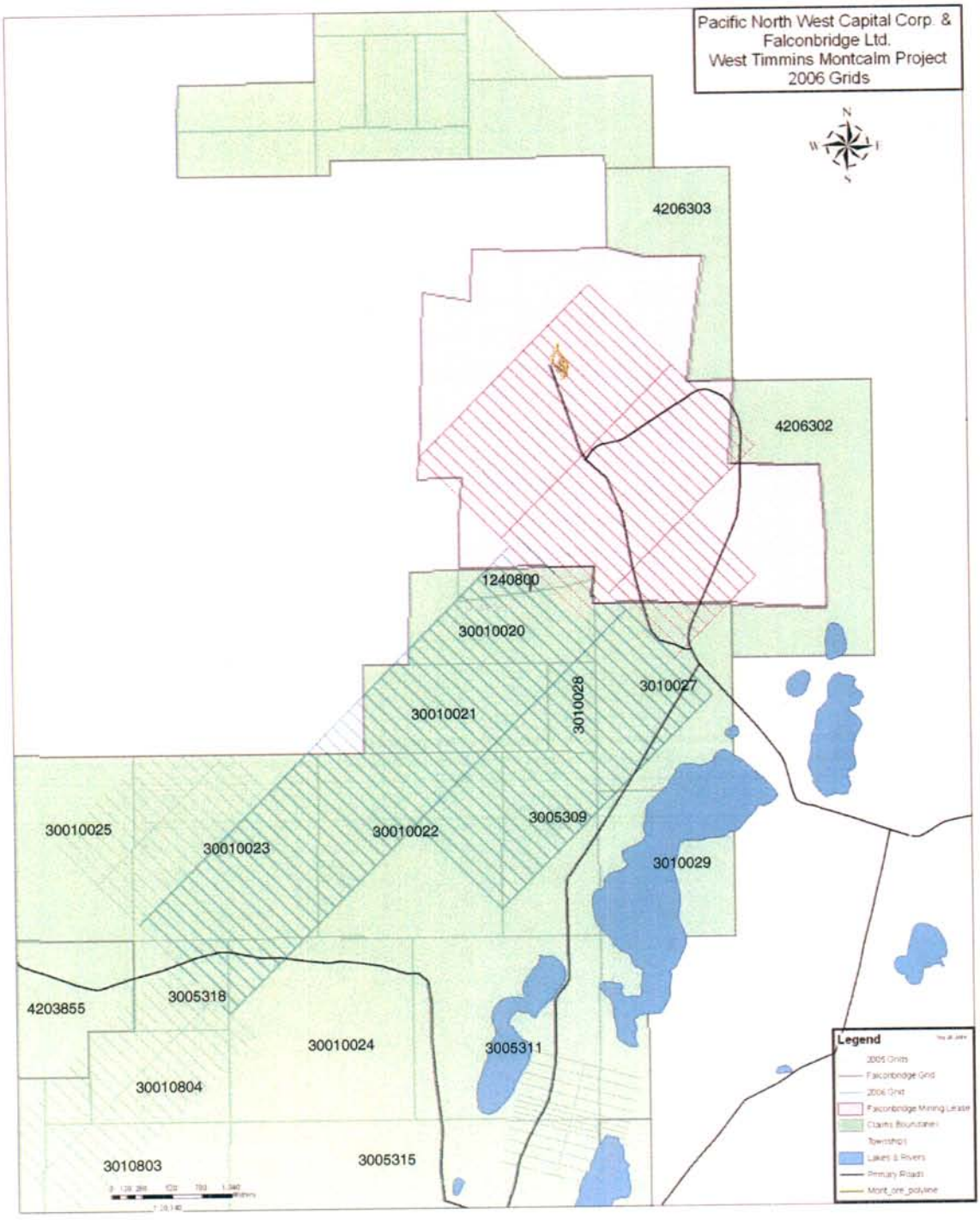


Figure 2: Montcalm Project 2006 Grid Map with Claim Boundaries

3 CLAIMS AND PROPERTY STATUS

Table 1: West Timmins Project Claim List

West Timmins Project Claim List						
CLAIM NUMBER	UNITS	HECTARES	TOWNSHIP	RECORDED	DUE DATE	OWNERSHIP
1169592	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169593	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169594	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169606	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169607	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169608	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169609	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169610	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169611	1	16	BELFORD	Oct 09/1990	Oct 09/2007	Xstrata Nickel
3006250	16	256	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006251	12	192	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006252	12	192	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006253	8	128	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006257	16	256	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006258	4	64	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006259	9	144	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006260	15	240	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006261	12	192	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006286	16	256	BELFORD	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3008911	15	240	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008912	15	240	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008913	13	208	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008914	16	256	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008926	2	32	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008927	16	256	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008929	15	240	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008930	9	144	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008931	6	96	BELFORD	Oct 10/2003	Oct 10/2007	Xstrata Nickel
4200716	12	192	BELFORD	Mar01/2005	Mar 01/2007	Xstrata Nickel
4200717	15	240	BELFORD	Mar 01/2005	Mar 01/2007	Xstrata Nickel
4203045	3	48	BELFORD	Sept 07/2005	Sept 07/2007	Xstrata Nickel
4203046	3	48	BELFORD	Sept 07/2005	Sept 07/2007	Xstrata Nickel
4206308	12	192	BELFORD	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206319	4	64	BELFORD	Apr 19/2005	Apr 19 2007	Xstrata Nickel
4206350	14	224	BELFORD	May 09/2005	May 09/2007	Xstrata Nickel
4206351	16	256	BELFORD	May 09/2005	May 09/2007	Xstrata Nickel
4206352	16	256	BELFORD	May 09/2005	May 09/2007	Xstrata Nickel
4206353	16	256	BELFORD	May 09/2005	May 09/2007	Xstrata Nickel
4206354	8	128	BELFORD	May 09/2005	May 09/2007	Xstrata Nickel
3008918	16	256	GRIFFIN	Oct 10/2003	Oct 10/2007	Xstrata Nickel
4202914	4	64	GRIFFIN	Sept 07/2005	Sept 07/2007	Xstrata Nickel
4207721	16	256	GRIFFIN	Sept 07/2005	Sept 07/2007	Xstrata Nickel
4207722	16	256	GRIFFIN	Sept 07/2005	Sept 07/2007	Xstrata Nickel
4207723	8	128	GRIFFIN	Sept 07/2005	Sept 07/2007	Xstrata Nickel

Table 1: West Timmins Project Claim List continued

4207725	2	32	GRIFFIN	Sept 07/2005	Sept 07/2007	Xstrata Nickel
3017279	12	192	MELROSE	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017280	16	256	MELROSE	Nov 17/2004	Nov 17/2007	Xstrata Nickel
1240890	2	32	MONTCALM	Mar 17/2003	Mar 17/2008	Xstrata Nickel
3005309	8	128	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005310	4	64	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005311	16	256	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005312	16	256	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005313	16	256	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005314	6	96	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005315	16	256	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005318	4	64	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005319	15	240	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005320	2	32	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005321	1	16	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006245	16	256	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006246	12	192	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009220	5	80	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009221	12	192	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009222	4	64	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009223	12	192	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009224	16	256	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009225	16	256	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009226	16	256	MONTCALM	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3010027	12	192	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3010028	2	32	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3010029	9	144	MONTCALM	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3010163	3	48	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010164	3	48	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010166	2	32	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010167	2	32	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010168	2	32	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010169	2	32	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010170	3	48	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010171	3	48	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010172	7	112	MONTCALM	Jun 26/2003	Jun 26/2007	Xstrata Nickel
3010803	8	128	MONTCALM	Nov 25/2002	Nov 25/2007	Xstrata Nickel
3010804	6	96	MONTCALM	Nov 25/2002	Nov 25/2007	Xstrata Nickel
3010805	12	192	MONTCALM	Nov 25/2002	Nov 25/2007	Xstrata Nickel
3010806	4	64	MONTCALM	Nov 25/2002	Nov 25/2007	Xstrata Nickel
3010807	16	256	MONTCALM	Nov 18/2002	Nov 18/2007	Xstrata Nickel
3017516	12	192	MONTCALM	Apr 06/2004	Apr 06/2007	Xstrata Nickel
4203855	11	176	MONTCALM	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206302	12	192	MONTCALM	May 09/2005	May 09/2007	Xstrata Nickel
4206303	8	128	MONTCALM	May 09/2005	May 09/2007	Xstrata Nickel
4206310	8	128	MONTCALM	Apr 19/2005	Apr 19/2007	Xstrata Nickel
30010020	8	128	MONTCALM	Nov 25/2002	Nov 25/2007	Xstrata Nickel
30010021	8	128	MONTCALM	Nov 25/2002	Nov 25/2007	Xstrata Nickel
30010022	16	256	MONTCALM	Nov 18,2002	Nov 18/2007	Xstrata Nickel
30010023	16	256	MONTCALM	Nov 18,2002	Nov 18/2007	Xstrata Nickel
30010024	16	256	MONTCALM	Nov 18,2002	Nov 18/2007	Xstrata Nickel
30010025	16	256	MONTCALM	Nov 18,2002	Nov 18/2007	Xstrata Nickel

Table 1: West Timmins Project Claim List continued

30010026	6	96	MONTCALM	Nov 18,2002	Nov 18/2007	Xstrata Nickel
1169600	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169601	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169602	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169603	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169604	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169605	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169612	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169613	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169614	1	16	NOVA	Oct 09/1990	Oct 09/2007	Xstrata Nickel
3006238	12	192	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006239	16	256	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006241	15	240	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006242	6	96	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006287	4	64	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006288	12	192	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006289	16	256	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006300	9	144	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006301	2	32	NOVA	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3017262	8	128	NOVA	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017263	2	32	NOVA	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017264	16	256	NOVA	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017265	3	48	NOVA	Nov 17/2004	Nov 17/2007	Xstrata Nickel
1200538	2	32	STRACHAN	Dec 20/1993	Dec 20/2008	Xstrata Nickel
1240891	1	16	STRACHAN	June 24/2003	June 24/2007	Xstrata Nickel
3005316	8	128	STRACHAN	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3005317	8	128	STRACHAN	Apr 23/2003	Apr 23/2007	Xstrata Nickel
3006240	16	256	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006243	16	256	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006244	16	256	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006306	7	112	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006307	12	192	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006308	9	144	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3009227	3	48	STRACHAN	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3017266	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017267	12	192	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017268	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017269	8	128	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017270	4	64	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017271	9	144	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017272	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017273	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017274	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017275	12	192	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017276	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017277	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017278	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017281	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017282	8	128	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017283	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017284	16	256	STRACHAN	Nov 17/2004	Nov 17/2007	Xstrata Nickel
3017288	12	192	STRACHAN	Nov 18/2004	Nov 18/2007	Xstrata Nickel

Table 1: West Timmins Project Claim List continued

3017289	9	144	STRACHAN	Nov 18/2004	Nov 18/2007	Xstrata Nickel
3017515	6	96	STRACHAN	Nov 18/2004	Nov 18/2007	Xstrata Nickel
4202972	7	112	STRACHAN	May 09/2005	May 09/2007	Xstrata Nickel
4206300	14	224	STRACHAN	May09/2005	May 09/2007	Xstrata Nickel
4206301	9	144	STRACHAN	May 09/2005	May 09/2007	Xstrata Nickel
4206311	6	96	STRACHAN	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206312	16	256	STRACHAN	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206315	8	128	STRACHAN	Apr 19/2005	Apr 19/2007	Xstrata Nickel
1169586	1	16	WATSON	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169587	1	16	WATSON	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169588	1	16	WATSON	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169589	1	16	WATSON	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169590	1	16	WATSON	Oct 09/1990	Oct 09/2007	Xstrata Nickel
1169591	1	16	WATSON	Oct 09/1990	Oct 09/2007	Xstrata Nickel
3006302	15	240	WATSON	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006303	15	240	WATSON	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006304	15	240	WATSON	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3006305	12	192	WATSON	Apr 28/2003	Apr 28/2007	Xstrata Nickel
3008915	16	256	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008916	16	256	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008917	16	256	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008919	16	256	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008920	16	256	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008921	8	128	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008922	8	128	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008923	1	16	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008924	10	160	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
3008925	15	240	WATSON	Oct 10/2003	Oct 10/2007	Xstrata Nickel
4203047	3	48	WATSON	Sept 07/2005	Sept 07/2007	Xstrata Nickel
4206309	6	96	WATSON	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206313	12	192	WATSON	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206316	15	240	WATSON	Apr 19/2005	Apr 19/2007	Xstrata Nickel
4206355	16	256	WATSON	May 09/2005	May 09/2007	Xstrata Nickel
4206356	1	16	WATSON	May 09/2005	May 09/2007	Xstrata Nickel
4206359	4	64	WATSON	May 09/2005	May 09/2007	Xstrata Nickel
4207724	4	64	WATSON	Sept 07/2005	Sept 07/2007	Xstrata Nickel
Totals	**1682**	**26928**				

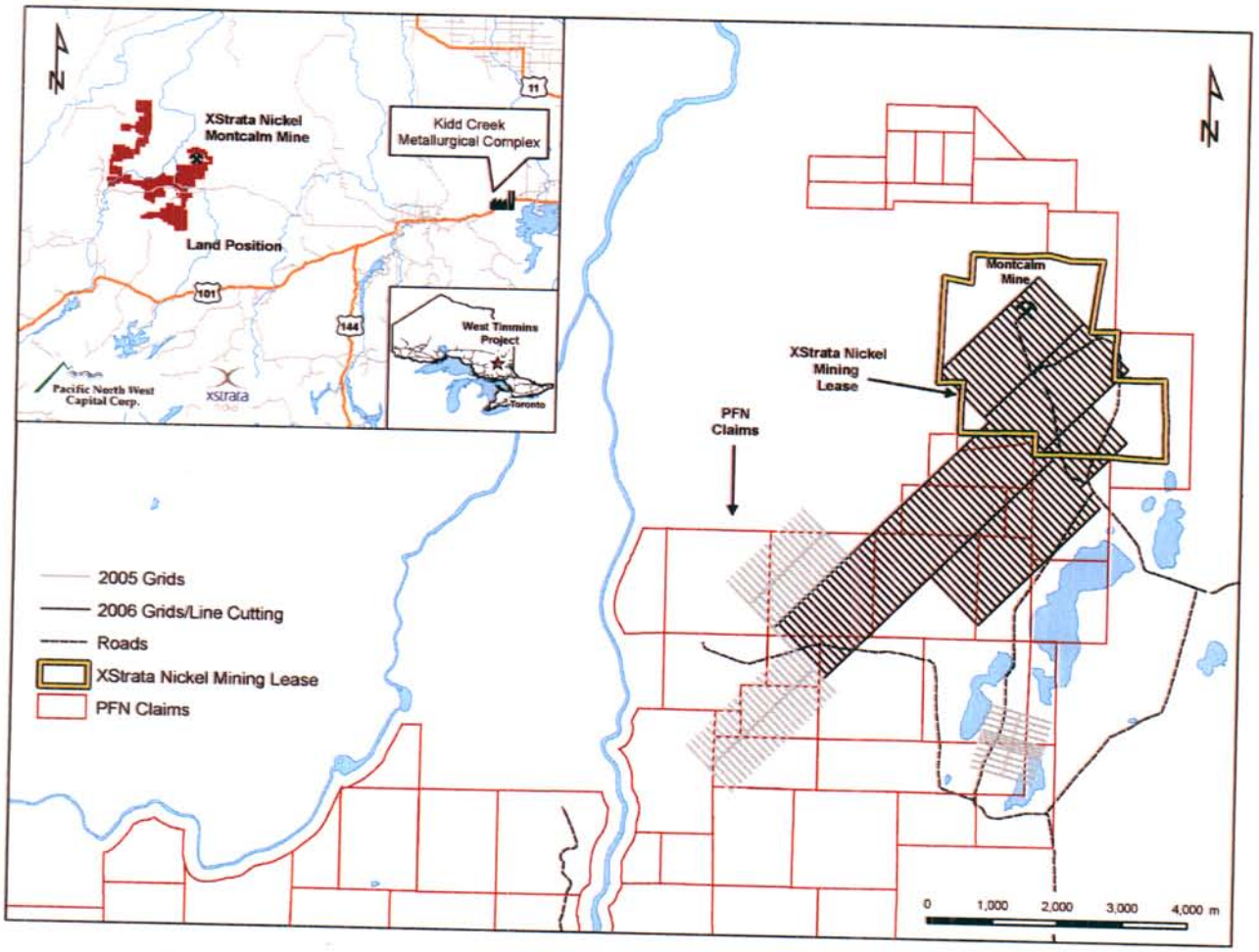


Figure 3: Pacific North West Montcalm Area Grid Map

4 PERSONNEL

The following personnel were involved in the collection of the data and production of this report:

Survey Operator: Dan Brazeau, Rob Chapman, Wayne Pearson
Report: Kevin Ralph

5 SURVEY METHOD & EQUIPMENT

Crone Pulse EM is a time domain electromagnetic method in which a precise pulse of current with a controlled linear shut off is transmitted through a large loop of wire on the ground and the rate of decay of the induced secondary field is measured across a series of time windows during the off-time. The electro-magnetic field (EMF) created by the shutting-off of the current induces eddy currents in nearby conductive material thus setting-up a secondary magnetic field. When the primary field is terminated, this magnetic field will decay with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor.

The equipment used on this project was a Crone Pulse EM Surface system. This includes a 4.8kW transmitter with a 240V voltage regulator powered by an 11 hp motor generator. The Crone Digital Receiver was used to collect the field data. The synchronization between the Transmitter and the Receiver was maintained by crystal clock synchronization for surface work.

In addition to measuring the standard Primary Pulse channel on the ramp and the 20 off-time channels, the Step Response was also calculated. Since this requires accurate geometrical control, the loop and station position were determined by GPS. The Crone Step Response transformation was then performed on the data. The calculated Step Response values were binned into an S1 channel (from 0.5T to T), an S2 channel (from 0.25T to 0.5T), an S3 channel (from 0.125T to 0.25T) and an S4 channel (from 0.0625T to 0.125T, where T is the time base). The S1 channel is normalized to the theoretical primary field, while S2, S3 and S4 are normalized to S1.

The following table shows the various time gates, in ms, that constitute the channel configurations set up in the Crone PEM Receiver used in the surveys.

Table II: Channel Configuration, 20 Channels- 16.66 msec Time Base

Channel	Start	Finish	Channel	Start	Finish
PP	-1.982e-04	-9.900e-05	1	4.800e-05	6.400e-05
2	6.400e-05	8.400e-05	3	8.400e-05	1.120e-04
4	1.120e-04	1.520e-04	5	1.520e-04	2.040e-04
6	2.040e-04	2.680e-04	7	2.680e-04	3.600e-04
8	3.600e-04	4.800e-04	9	4.800e-04	6.400e-04
10	6.400e-04	8.480e-04	11	8.480e-04	1.128e-03
12	1.128e-03	1.496e-03	13	1.496e-03	1.992e-03
14	1.992e-03	2.644e-03	15	2.644e-03	3.512e-03
16	3.512e-03	4.664e-03	17	4.664e-03	6.192e-03
18	6.192e-03	8.220e-03	19	8.220e-03	1.092e-02
20	1.092e-02	1.440e-02			

6 SURVEY PARAMETERS

Table III: Surface Survey Coverage – lines in yellow fall partially within Xstrata's Montcalm Mining Claims

Line	Tx loop	Start	End	Length Read (m)	Component Measured
9500 N	4	4100 E	6300 E	2200	X,Z
9700 N	4	3025 E	6300 E	3275	X,Z
9800 N	4	3000 E	5150 E	2150	X,Z
9900 N	4	3025 E	6300 E	3275	X,Z
10100 N	4	3000 E	5800 E	2800	X,Z
10300 N	4	3025 E	5800 E	2775	X,Z
9400 N	5	4100 E	6275 E	2175	X,Z
9600 N	5	4100 E	6275 E	2175	X,Z
9800 N	5	4000 E	6275 E	2275	X,Z
10000 N	5	4000 E	5800 E	1800	X,Z
10200 N	5	4100 E	5775 E	1675	X,Z
8300 N	6	4150 E	6300 E	2150	X,Z
8500 N	6	4100 E	6300 E	2200	X,Z
8700 N	6	4150 E	6300 E	2150	X,Z
8900 N	6	4100 E	6275 E	2175	X,Z
9100 N	6	4100 E	6250 E	2150	X,Z
9300 N	6	4100 E	6250 E	2150	X,Z
8200 N	7	4150 E	6200 E	2050	X,Z
8400 N	7	4125 E	6300 E	2175	X,Z
8600 N	7	4125 E	6300 E	2175	X,Z
8800 N	7	4125 E	6300 E	2175	X,Z
9000 N	7	4125 E	6300 E	2175	X,Z
9200 N	7	4125 E	6300 E	2175	X,Z
7500 N	9	4100 E	6275 E	2175	X,Z
7700 N	9	4100 E	6275 E	2175	X,Z
7900 N	9	4100 E	6300 E	2200	X,Z
8100 N	9	4125 E	6275 E	2150	X,Z

Table IV: Pulse EM Survey Parameters and Loop Location

Loop	Size (meters)	Loop Location Grid/ UTM Loop Corners	Ramp Time	Current	Time Base
Loop 4	1200 x 1200	9300 E – 10500 E 4000 N – 5200 N / 418222 E, 5390040 N 419083 E, 5389149 N 419941 E, 5390001 N 419053 E, 5390851 N	1.5 ms	13 amps	16.66 msec
Loop 5	1300 x 1100	9300 E – 10600 E 5200 N – 6300 N / 419089 E, 5389150 N 419885 E, 5388387 N 420794 E, 5389363 N 420028 E, 5390081 N	1.5 ms	12 amps	16.66 msec
Loop 6	1100 x 1300	5200 E – 6300 E 8100 N – 9400 N/ 418260 E, 5388290 N 419060 E, 5387526. N 419965 E, 5388469 N 419149 E, 5389209 N	1.5 ms	12 amps	16.66 msec
Loop 7	1100 x 1200	5200 E – 6300 E 8100 N – 9300 N/ 417473 E, 5389055 N 418264 E, 5388295 N 419156 E, 5389228 N 418358 E, 5389975 N	1.5 ms	12 amps	16.66 msec
Loop 9	800 x 1100	5200 E- 6300 E 7400 N – 8200 N / 417793 E, 5387761 N 418585 E, 5387019 N 419134 E, 5387595 N 418328 E, 5388350 N	1.5 ms	15 amps	16.66 msec

7 PRODUCTION SUMMARY

Table V: Production Survey

Date	Description
March 2006	
20	Got maps for Loop 1A and laid ¾ of the loop
21	Finished laying out Loop 1A and laid out part of Loop 5. Went to mine for mine induction. After induction moved in some equipment to Loop 1A.
22	Laid out part of Loop 5 and brought in the rest of the equipment to Loop 1A.
23	No survey
24	Accessed site, set up and surveyed lines 10800N and 10900N on Loop 1A.
25	Set up and surveyed lines 10600N and 10700N. This finished Loop 1A, packed up some equipment and moved it out. Continued laying Loop 2.
26	Accessed Loop 1A and took out the rest of the equipment. Moved to Loop 2 and finished laying out the loop. Posted safety signs on all locations where the wire crosses and roads and trails.
27	Set up and surveyed lines 10700N and 10900N (in-loop).
28	Set up and surveyed lines 11100N and 11300N (in-loop).
29	No survey
30	Set up and surveyed lines 11500N and 11700N (in-loop)
31	No survey
April 2006	
1	No Survey
2	Set up and surveyed lines 11500N and 11700N (out of loop).
3	Set up and surveyed lines 11100N and 11300N (out of loop).
4	No survey
5	Set up and surveyed line 10700N and 10900N (out of loop).
6	Started to move Loop 2 to finish Loop 1. Pulled out the wire that was not needed for Loop 1 to the road
7	Finished laying Loop 1 after getting wire from Loop 2 and Loop 1A. GPS'ed loop 1 and picked up the remainder of Loop 1A and Loop 2. Fixed wire at the roads and put danger signs in appropriate locations.
8	Set up on Loop 1. Surveyed lines 10600N, 10800N, 11000N and 11200N (all in-loop).
9	Set up on Loop 1. Surveyed 11200N, 11000N (out of loop) Surveyed 11400N and 11600N (in-loop).
10	Set up and surveyed lines 10800N and 11000N (out of loop).
11	No survey
12	No survey
13	Packed up equipment and left the area.
May 2006	
1	Mobilized from Mississauga to Timmins
2	Organized equipment and attended site induction from 11am to 12pm. Went out to find the loop wire and other locations.
3	Set up at the survey site, surveyed lines 11400N and 11700N on Loop 1.
4	Finished laying out Loop 4.
5	Accessed the survey area, set up and surveyed line 10600N.
6	Accessed the survey area, set up and surveyed line 11600N. Picked up 1.2km of loop and laid it out for next loop.
7	Set up and surveyed line 10300N and 10400 on Loop 4. Laid out part of next loop.
8	Set up and finished lines 10300N and 10400N on Loop 4. GPS'ed loop.
9	Set up and surveyed lines 10100N and 10200N on Loop 4.
10	Set up and surveyed lines 10100N and 10200N. 200m on each line.
11	Set up and survey on line 10100N and GPS'ed Loop 2
12	Set up and survey line 10000N and finished 10200N
13	Set up and finished line 10000N, surveyed line 9800N and 9900N on Loop 4. GPS'ed loop and some lines.
14	Set up and surveyed lines 9800N and 9900N on Loop 4. GPS'ed lines
15	Set up and surveyed lines 9600N and 9700N on Loop 4. GPS'ed lines.
16	Set up and surveyed lines 9500N and 9700N on Loop 4. GPS'ed lines.

17	Set up and surveyed lines 9500N and 9700N.

Table V: Production Summary ...Continued

Date	Description
18	Set up and finished line 9500N and 9700N. Surveyed line 10100N.
19	Set up and finished lines 9900N, 10300N and 10400N on Loop 4. GPS'ed the lines.
20	No Survey
21	No Survey
22	Moved all equipment over to Loop 1 Set up and surveyed lines 10800N, 10900N and 11200N. Started to lay out Loop 3.
23	Set up and surveyed line 10600N and 10800N. Finished laying out Loop 3.
24	Set up and surveyed lines 9800N, 10000N, 10200N and 10400N on Loop 3. GPS'ed lines.
25	Pick up Argo, set up and finished lines 10000N and 10400N. Started to pick up Loop 4.
26	No Survey
27	Set up and continued survey on lines 9800N and 10200N. Started to lay out Loop 5.
28	Set up and finished line 10200N and surveyed line 9600N. GPS'ed Loop 3 and lines. Finished laying out Loop 5.
29	Packed up and moved equipment to Loop 5. Set up and started to survey lines 10000N, 10200N and 10400N. Picked up part of last loop.
30	Accessed site and picked up some wire.
31	Set up and finished line 10000N and started line 9800N. Picked up the remainder of the wire on Loops 1, 2 and 4. Started to lay out Loop 7.
June 2006	
1	Set up and surveyed lines 9600N and 9800N. GPS'ed lines and loop. Started to lay out Loop 7
2	Set up and finished lines 9600N and 9800N.
3	Set up and surveyed line 10200N. Continued to lay out Loop 7.
4	Set up and surveyed lines 9400N and 10400N. Continued to lay out Loop 7.
5	No Survey
6	Continued laying out Loop 7, moved transmitter equipment to new location
7	Continued laying out Loop 7.
8	No Survey
9	Set up and surveyed lines 8800N and 8600N from Loop 7
10	Set up and surveyed line 9000N, GPS'ed loop and lines
11	Set up and surveyed lines 8200N, 8400N and 9200N.
12	Set up and started to lay out Loop 6.
13	Set up and surveyed lines 8600N and 9200N.
14	Set up and finished the survey on lines 8600N, 9000N and 9200N
15	Set up and surveyed lines 8400N and 8800N.
16	Set up and finished line 8200N. GPS'ed loop and laid out more of Loop 6.
17	No survey
18	Continued to lay Loop 6
19	No survey
20	Set up and surveyed lines 8300N and 8900N on Loop 6. GPS'ed loop
21	Set up and surveyed lines 8500N and 9100N. GPS'ed loop.
22	Set up and continued line 8500N. GPS'ed loop and lines
23	Set up and finished line 8500N, GPS'ed loop and lines.
24	Set up and surveyed lines 8700N and 9300N, GPS'ed loop and lines.
25	Set up and surveyed lines 8700N, 9100N and 9300N. GPS'ed loop and lines.
26	Set up and surveyed lines 8300N and 9300N, GPS'ed lines.
27	GPS'ed loop and lines.
28	Picked up and tested new equipment
29	Set up and surveyed lines 8300N, 8500N, 8900N and 9100N. GPS'ed lines and loops.
30	Set up and finished lines 8500N and 8900N, this finished Loop 6. Finished the GPS survey on Loop 4.

Table V: Production Summary ...Continued

Date	Description
July 2006	
1	No Survey
2	No Survey
3	Moved transmitter equipment back to Loop 5, Set up and surveyed line 10400N. Started to GPS Loop 6
4	Set up and surveyed lines 10200N and 9400N, GPS'ed Loop 6 and Loop 7.
5	Set up and surveyed lines 9600N and 10000N, GPS on Loop 7.
6	Set up and surveyed lines 9400N and 9800N, GPS on Loop 5.
7	Set up and continued to survey lines 9400N and 9800N. Started to pick up Loop 6 and GPS'ed Loop 7.
8	No Survey
9	Went out and GPS'ed loop and started to lay out Loop 9.
10	Finished line 9600N on Loop 5, Continued to lay out Loop 9.
11	Finished laying out Loop 9, set up transmitter equipment and checked loop.
12	GPS'ed loop and lines.
13	GPS'ed and started to pick up wire
14	No Survey
15	Picked up equipment from the field.
August 2006	
21	Mobilization and set-up
22	Read lines 8100N and 7500N
23	Read lines 7900N and 7700N
24	Finished reading 7700N. GPSing
25	GPSing and picking up loop 9
26	Picked up some of Loop 5 and some of Loop.
27	Picking up loop wire. GPSing
28	Picking up loop wire. GPSing
29	No Survey
30	Finished picking up loop wire and finished GPSing.
31	Demobilized

8 DATA DISCUSSION

At the request of Falconbridge Ltd. (now Xstrata Nickel) and Pacific North West Capital a survey configuration was proposed for the Montcalm Project Area to allow for the detection of any target within 200-400 m of surface regardless of the orientation of the target. The proposal put forward was to survey the entire area with a loop configuration which ensured that each station (on adjacent lines) was surveyed both inside and outside of each transmit loop. The change in coupling provided by this method would ensure that any target, regardless of its orientation would be well energized. All loops were surveyed at 200m line intervals (with the exception of Loop 1A). The following figures depicts the Loop design for the entire survey area, including the adjacent Falconbridge Ltd. Montcalm Grid which was surveyed at the same time.

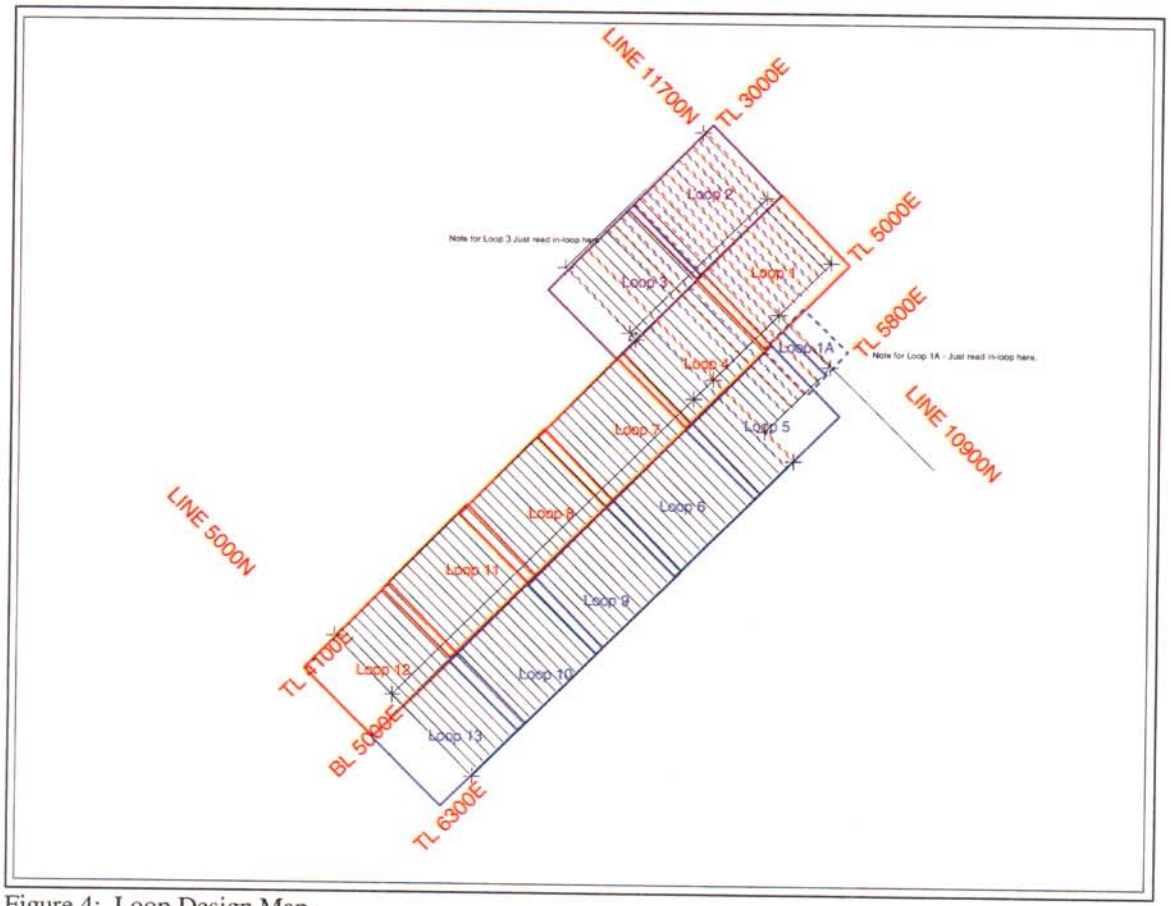


Figure 4: Loop Design Map

The following figures show a very simplistic view of the benefits of this overlapping coverage utilizing a very modest size conductor with dimensions of 250 m x 250 m and a conductance of 150 S. Figures 5 – 8 below show the modeling results for a near vertical conductor which is located 500 m outside of Loop 1, and exactly in the middle of Loop 2. These results highlight one of the major downfalls of only performing In-Loop Surveys as any targets near the middle of the transmit loop will be null or poorly coupled.

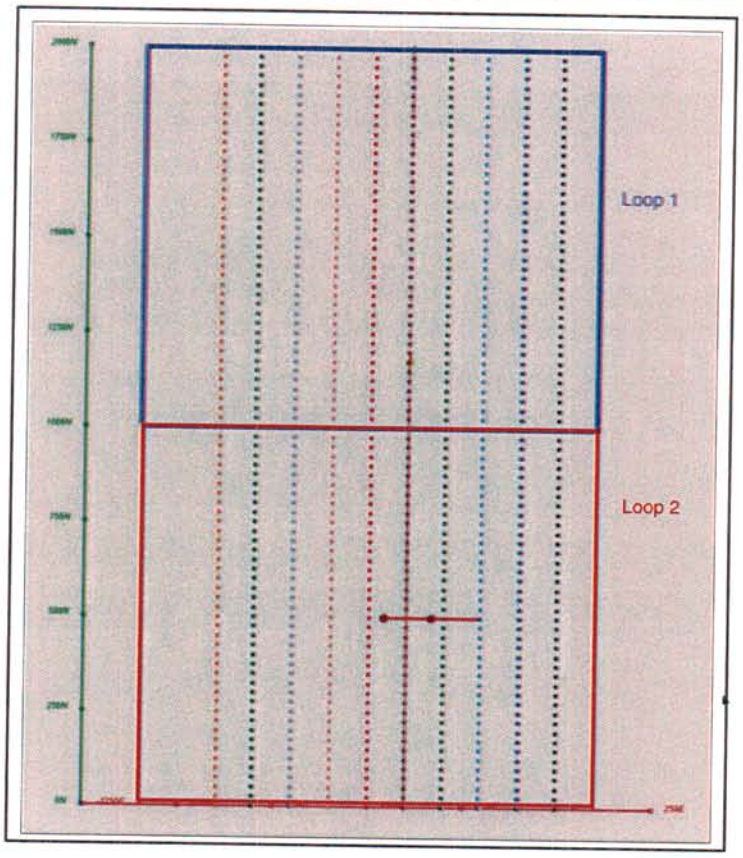


Figure 5: Plan Map of In-Loop and Out-of Loop Survey Configuration

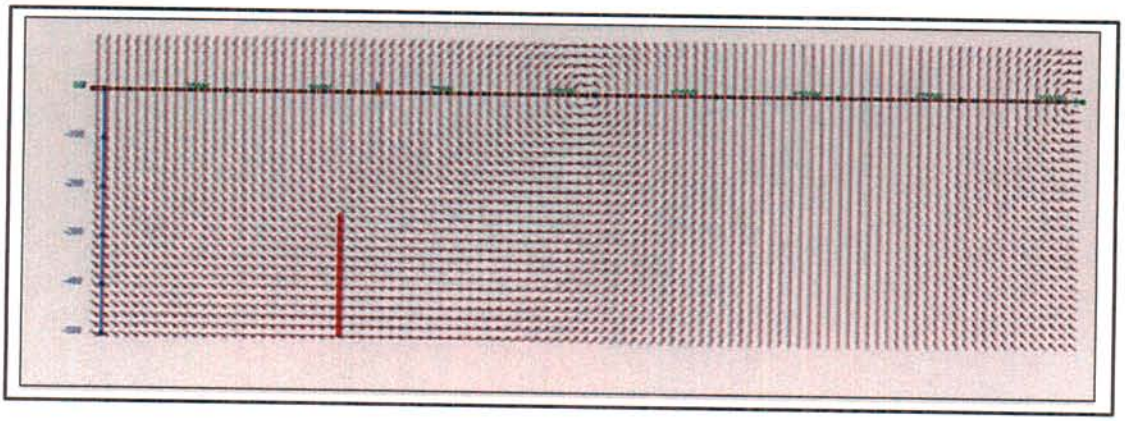


Figure 6: Primary Field Coupling for Out of Loop Survey

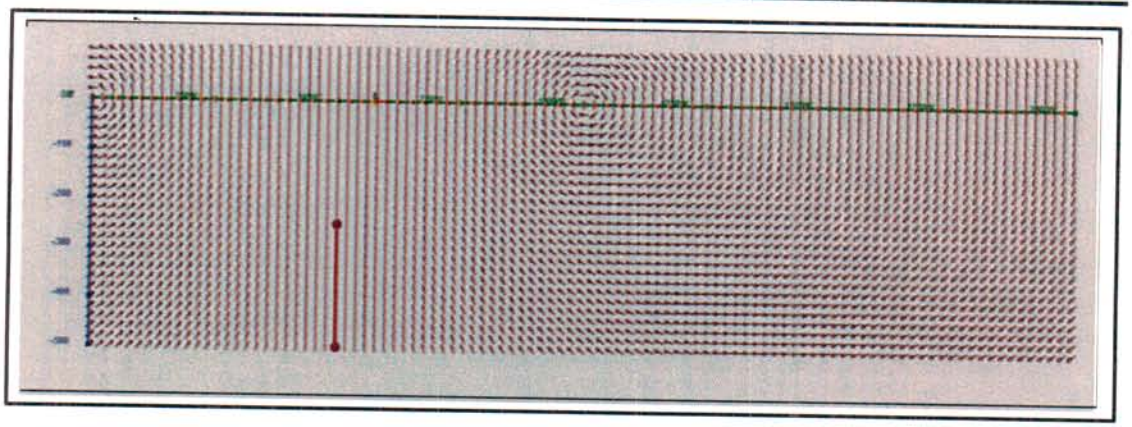


Figure 7 : Primary Field Coupling for In - Loop Survey

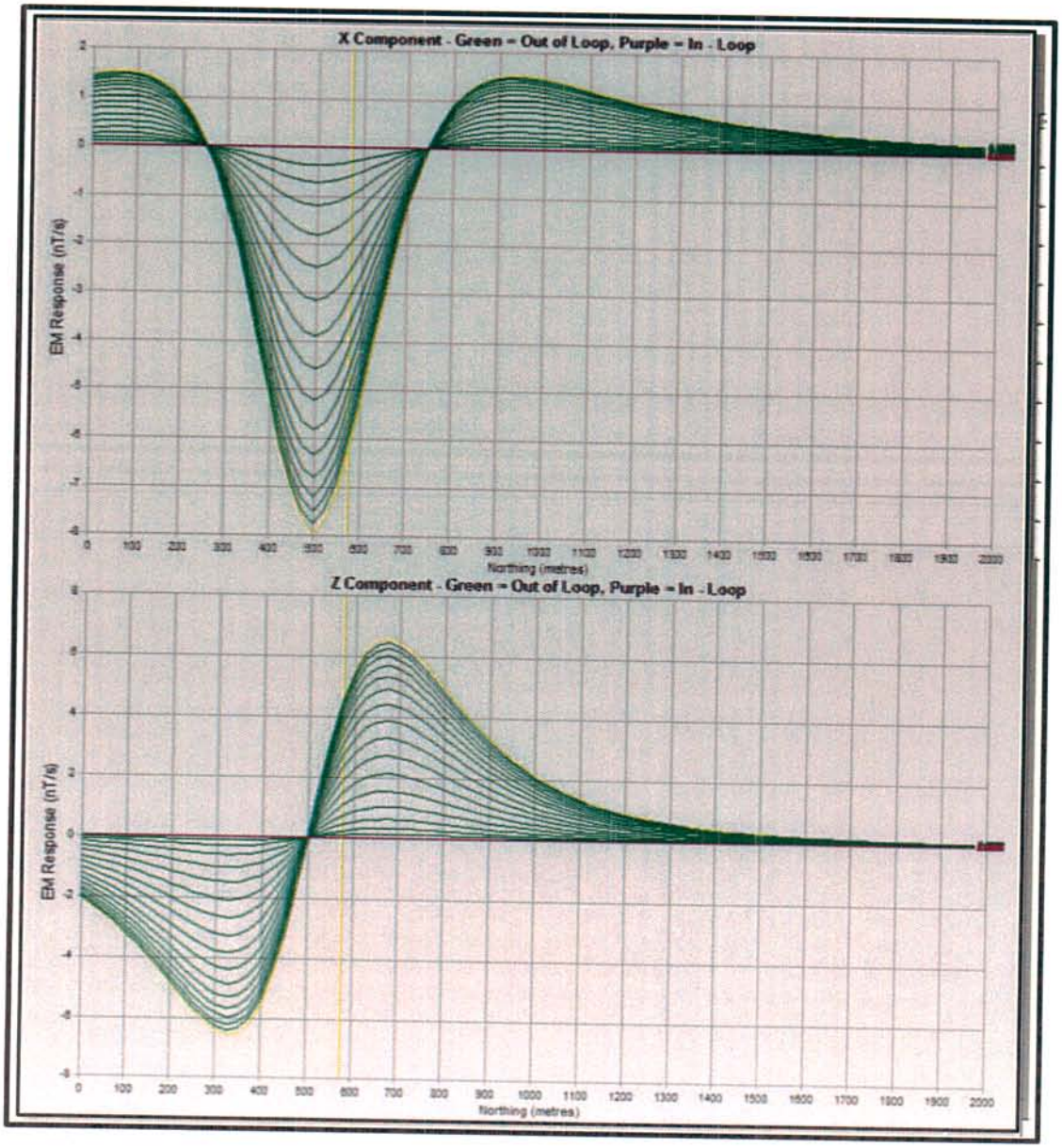


Figure 8: Numerical Modeling Results, Null Coupling vs Excellent Coupling

Next lets consider the case of the same target located ~800 m away from the Loop Edge (for an Out of Loop Survey) and compare these results with an In-Loop mode. If we totally ignore the effect of current channeling and concentrate totally on the inductive response, it is quite apparent that the depth of detection for a modest sized target falls off dramatically at large distances from the transmit loop. In the Figures below note that the vertical source (now 800m from the loop edge) is best defined by the In-Loop survey.

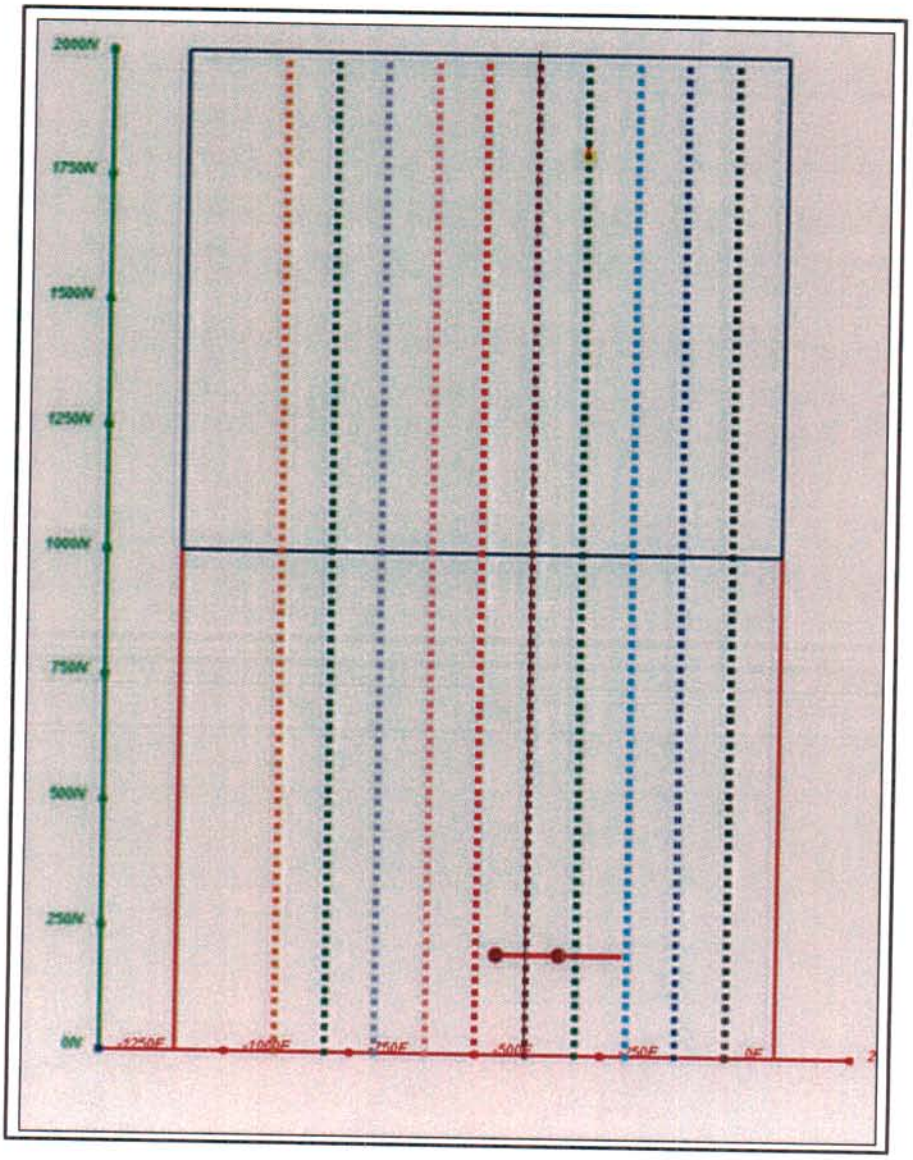


Figure 9: Plan view of Conductor 800 from Loop Edge.

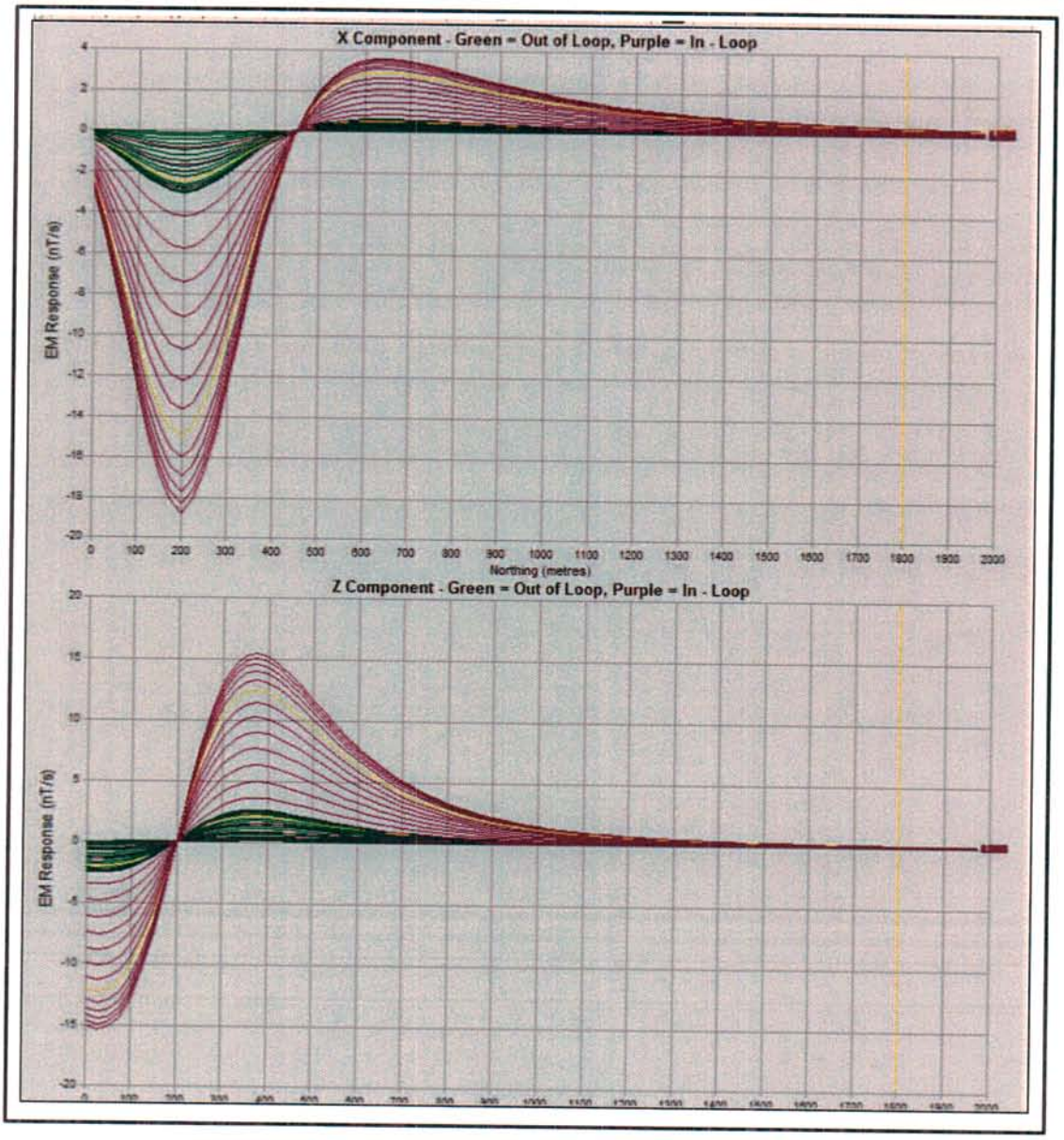


Figure 10: Numerical Modeling Results – Vertical conductor 800m from Loop Edge.

These simple models serve to illustrate the effectiveness of the loop configuration in the survey design and help to ensure that no potential targets go undetected.

There were logistically difficulties encountered during this survey and some of these difficulties meant that not all of the GPS points were collected at the same time as the TDEM data. In the Step Profiles, there is evidence of Geometric Errors on certain lines and this I attribute to the GPS point not been taken at the same point as the TDEM data. This is not totally unexpected as some of the GPS points were taken after spring break-up and indeed some of the station points were estimates due to missing pickets.

The interpretation of this data set is best considered as an *Interpretation Summary* with the results summarized in Table VI below. It should be noted that in this table numerous anomalies have been identified as a (possible) culture source. At the time of the writing of this report, I did not have access to all the necessary information to verify that these anomalies are indeed caused by local culture, and it is strongly recommended for the Project Geologist to verify this. For the sake of simplicity I have included a column here listing anomalies as low, medium, or high priority. To arrive at such a prioritization scheme I have made a very broad and generalized assumption that because the focus here is on Nickel Exploration the weak, or early channel anomalies are not of interest. If the focus of this exploration was a Zn, or Cu-Zn source, this generalization might not be valid and the data would have to be scrutinized much more closely to investigate the causes of the weak anomalous sources.

Table VI: Interpretation Summary

Loop	*Line*	*Station*	*# channels*	*Priority*	*Comments*
4	9500 N	4175 E	9	Low	Weak response, likely overburden related.
4	9500 N	4350 E	7	Low	Weak response, likely overburden related.
4	9700 N	3050 E	14	Medium	Response extends to mid-channels indicating a moderately conductive source. This could indicate current channeling along a geological contact.
4	9700 N	3525 E	8	Low	Weak response, likely overburden related.
4	9700 N	4350 E	7	Low	Weak response, likely overburden related.
4	9800 N	3025 E	14	Medium	Response extends to mid-channels indicating a moderately conductive source. This could indicate current channeling along a geological contact.
4	9800 N	3275 E	10	Low	Weak response, likely overburden related.
4	9800 N	3500 E	12	Low	Weak response, likely overburden related.
4	9900 N	3025 E	14	Medium	Response extends to mid-channels indicating a moderately conductive source. This could indicate current channeling along a geological contact.
4	9900 N	5525 E	20	Low	Culture
4	9900 N	>6300 E	18	Low	End of line is anomalous and building rapidly, Culture source?
5	9400 N	4400 E	8	Low	Weak response, likely overburden related.
5	9400 N	4800 E	7	Low	Weak response, likely overburden related.
5	9400 N	5000 E	8	Low	Weak response, likely overburden related.
5	9600 N	4100 E	8	Low	End of line is anomalous with a subtle build-up to a weak conductor.
5	9600 N	4400 E	8	Low	Weak response, likely overburden related.
5	9600 N	4800 E	7	Low	Weak response, likely overburden related.
5	9800 N	4875 E	7	Low	Weak response, likely overburden related.
6	8300 N	4200 E	8	Low	Weak response, likely overburden related.
6	8300 N	4400 E	8	Low	Weak response, likely overburden related.
6	8500 N	4150 E	8	Low	Weak response, likely overburden related.
6	8500 N	4450 E	8	Low	Weak response, likely overburden related.
6	8700 N	4400 E	8	Low	Weak response, likely overburden related.
6	8700 N	4800 E	7	Low	Weak response, likely overburden related.
6	8900 N	4400 E	8	Low	Weak response, likely overburden related.
6	8900 N	4900 E	8	Low	Weak response, likely overburden related.
6	9100 N	4400 E	8	Low	Weak response, likely overburden related.
6	9100 N	4975 E	8	Low	Weak response, likely overburden related.
6	9300 N	4400 E	8	Low	Weak response, likely overburden related.
6	9300 N	4950 E	7	Low	Weak response, likely overburden related.
7	8200 N	5350 E	8	Low	Weak response, likely overburden related.
7	8200 N	5650 E	8	Low	Weak response, likely overburden related.
7	8200 N	6300 E	10	Low	Weak response, likely overburden related.
7	8400 N	5375 E	8	Low	Weak response, likely overburden related.
7	8400 N	5650 E	8	Low	Weak response, likely overburden related.
7	8400 N	6275 E	10	Low	Weak response, likely overburden related.
7	8600 N	5425 E	8	Low	Weak response, likely overburden related.

7	8600 N	5625 E	8	Low	Weak response, likely overburden related.
7	8600 N	6225 E	10	Low	Weak response, likely overburden related.
7	8800 N	5625 E	6	Low	Weak response, likely overburden related.
7	8800 N	6225 E	9	Low	Weak response, likely overburden related.
7	9000 N	5950 N	8	Low	Weak response, likely overburden related.
7	9000 N	6250 N	8	Low	Weak response, likely overburden related.
7	9200 N	5900 N	9	Low	Weak response, likely overburden related.
7	9200 N	6275 N	9	Low	Weak response, likely overburden related.
9	7500 N	4425 E	8	Low	Weak response, likely overburden related.
9	7500 N	5025 E	6	Low	Weak response, likely overburden related.
9	7700N	4425 E	8	Low	Weak response, likely overburden related.
9	7700 M	4925 E	6	Low	Weak response, likely overburden related.
9	7900 N	4450 E	9	Low	Weak response, likely overburden related.
9	8100 N	4475 E	8	Low	Weak response, likely overburden related.

From the Loop 4 survey one anomaly has been identified as a *Medium Priority* with Figure 11 below showing the location of this anomaly on lines 9700N, 9800N and 9900N. (This response occurs on the Xstrata claims but has been included here because of the potential for the anomaly to extend onto the PFN claims). The response here is most likely a current channeling response (possibly along a geological contact) but has been highlighted as a potential area of interest as it appears to lie along strike from high priority targets identified on the wholly owned Montcalm Lease. If this response is indeed along a geological contact, than further exploration along strike is highly recommended.

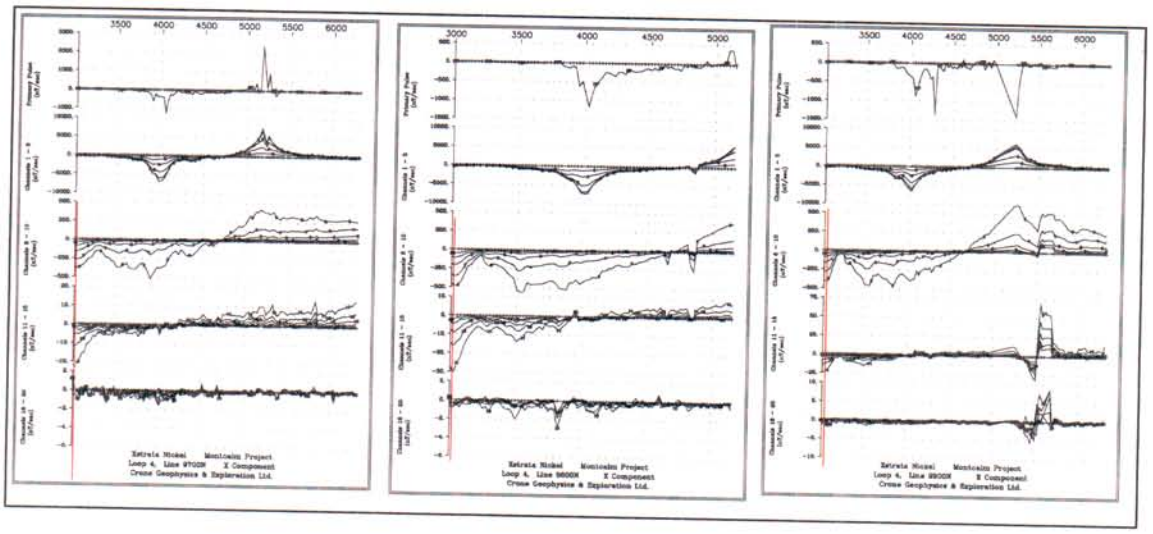


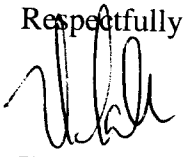
Figure 11: Loop 4, Lines 9700 N, 9800 N , and 9900 N -Interpreted Location of Bedrock Conductor

Summary

No anomalies have been identified as potential targets on the PFN claims from this survey. Numerous anomalous responses have been identified but all of early channel responses which are likely overburden related responses.

The most interesting response pattern is shown in Figure 12 above and this one I have ranked as a medium priority target. If this response does indeed lie near a geological contact than further exploration along strike onto the PFN claims here is highly recommended.

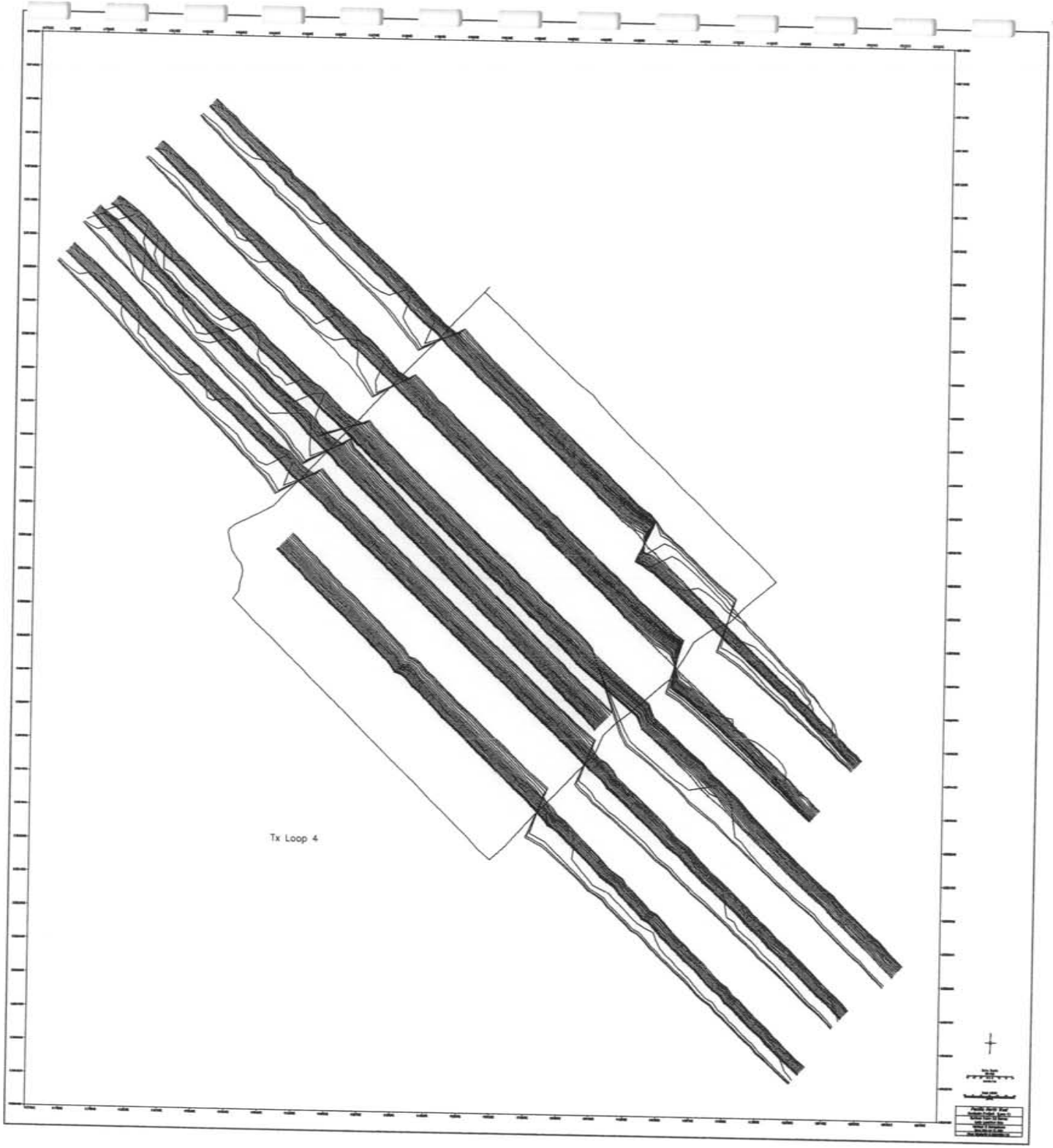
Respectfully submitted,

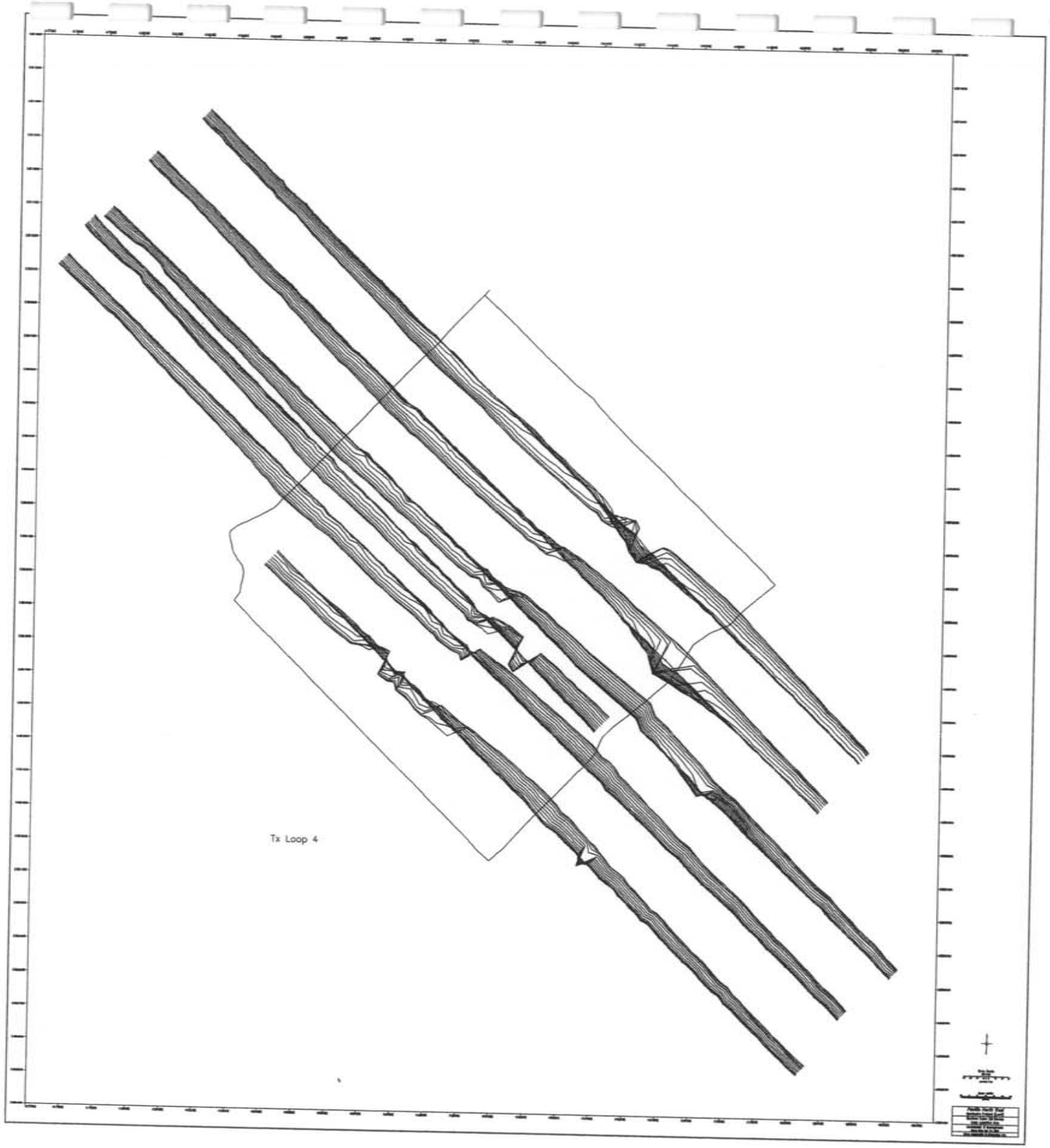


Kevin Ralph
Geophysicist
Crone Geophysics & Exploration Ltd.

APPENDIX I

PAGE SIZE PROFILE PLAN MAPS


Tx Loop 4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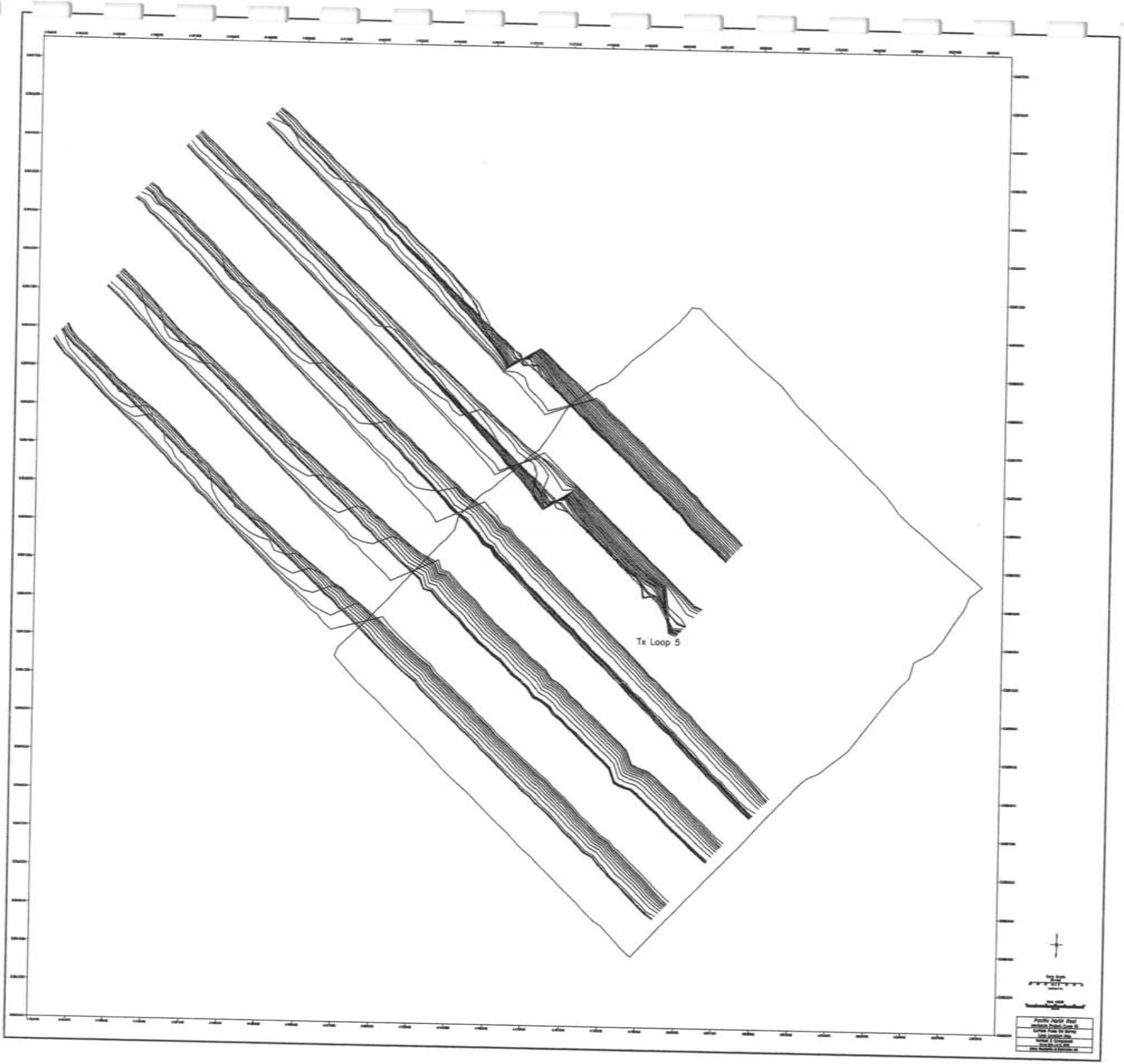
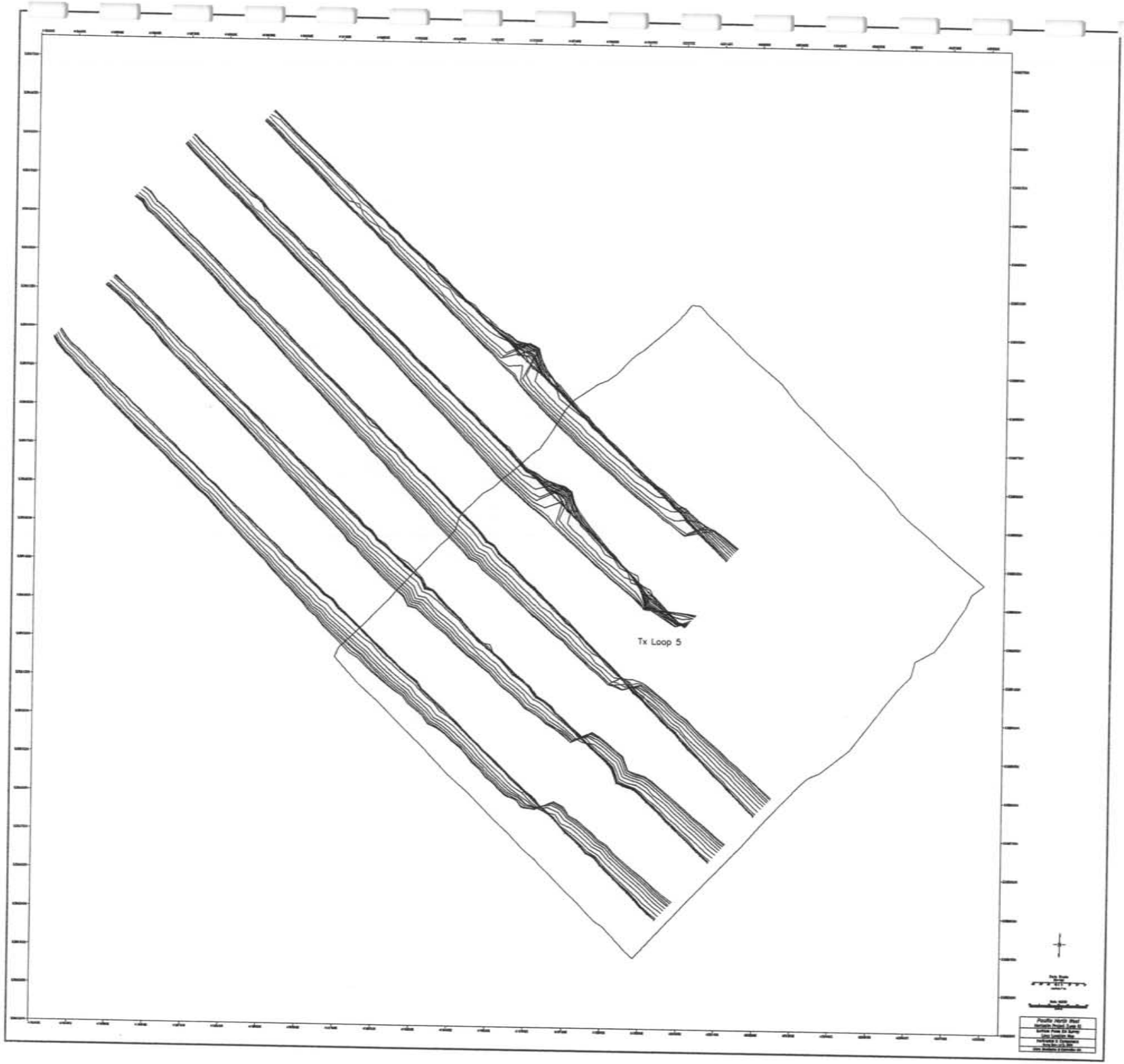

Tx Loop 5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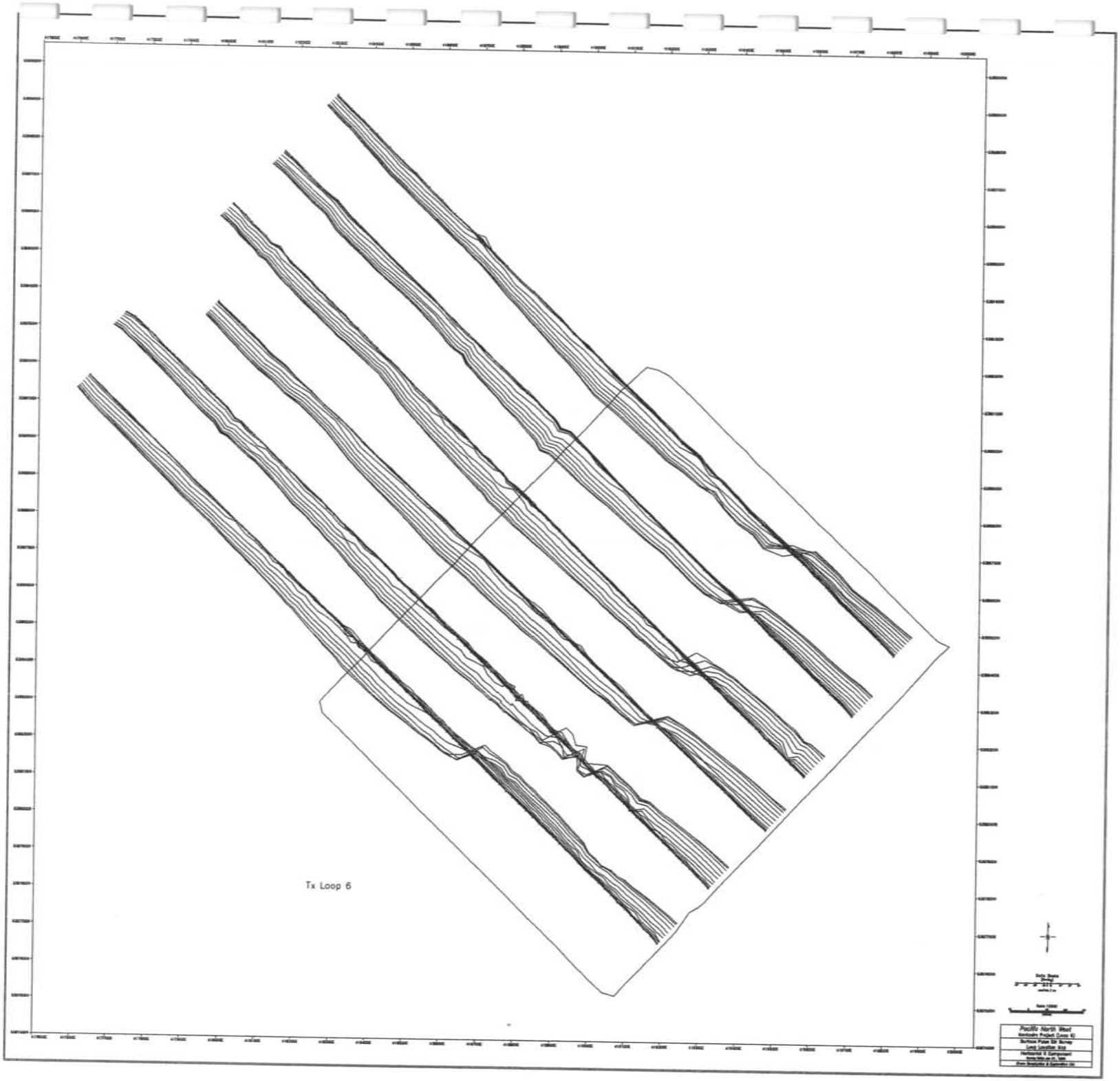
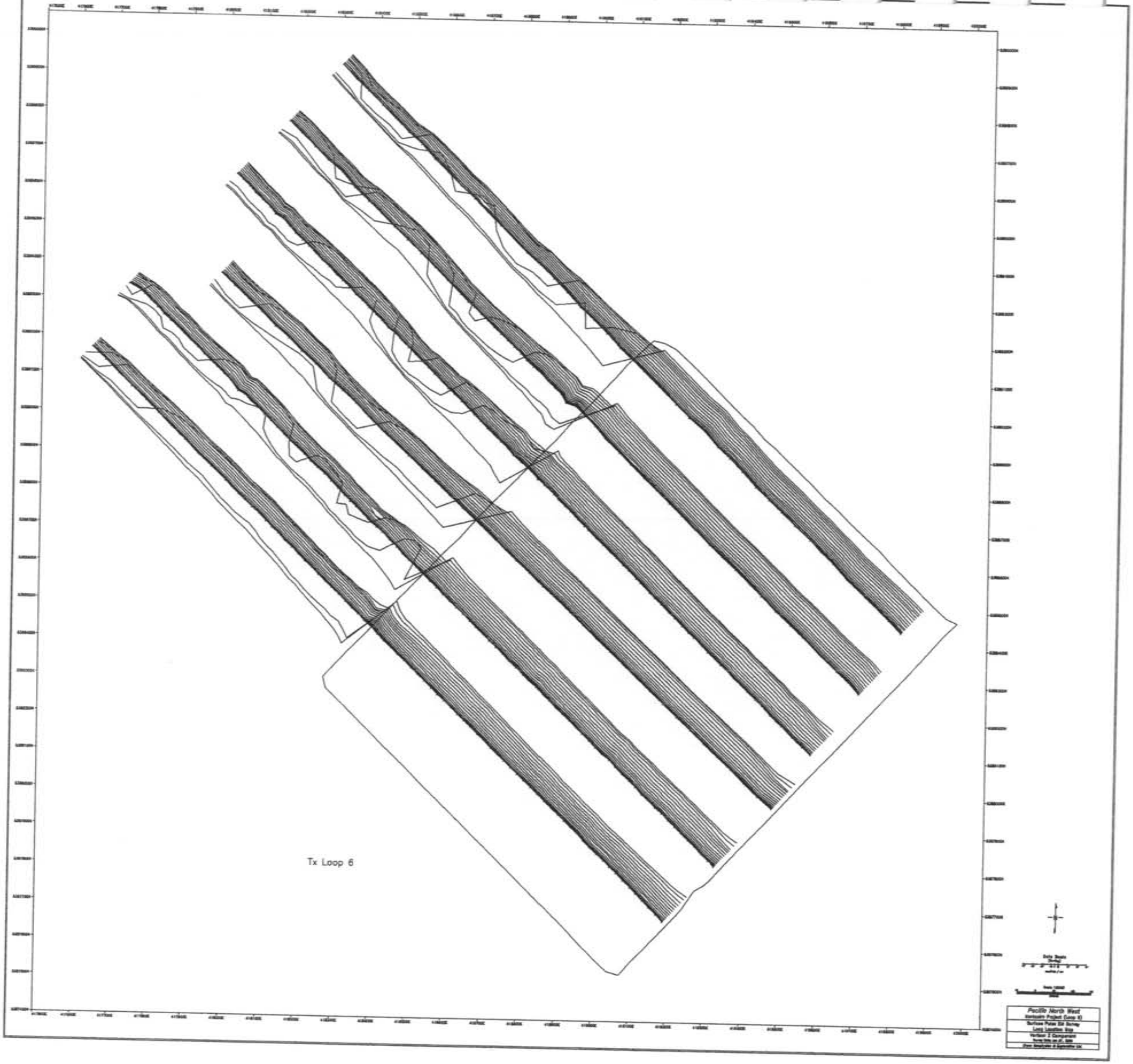
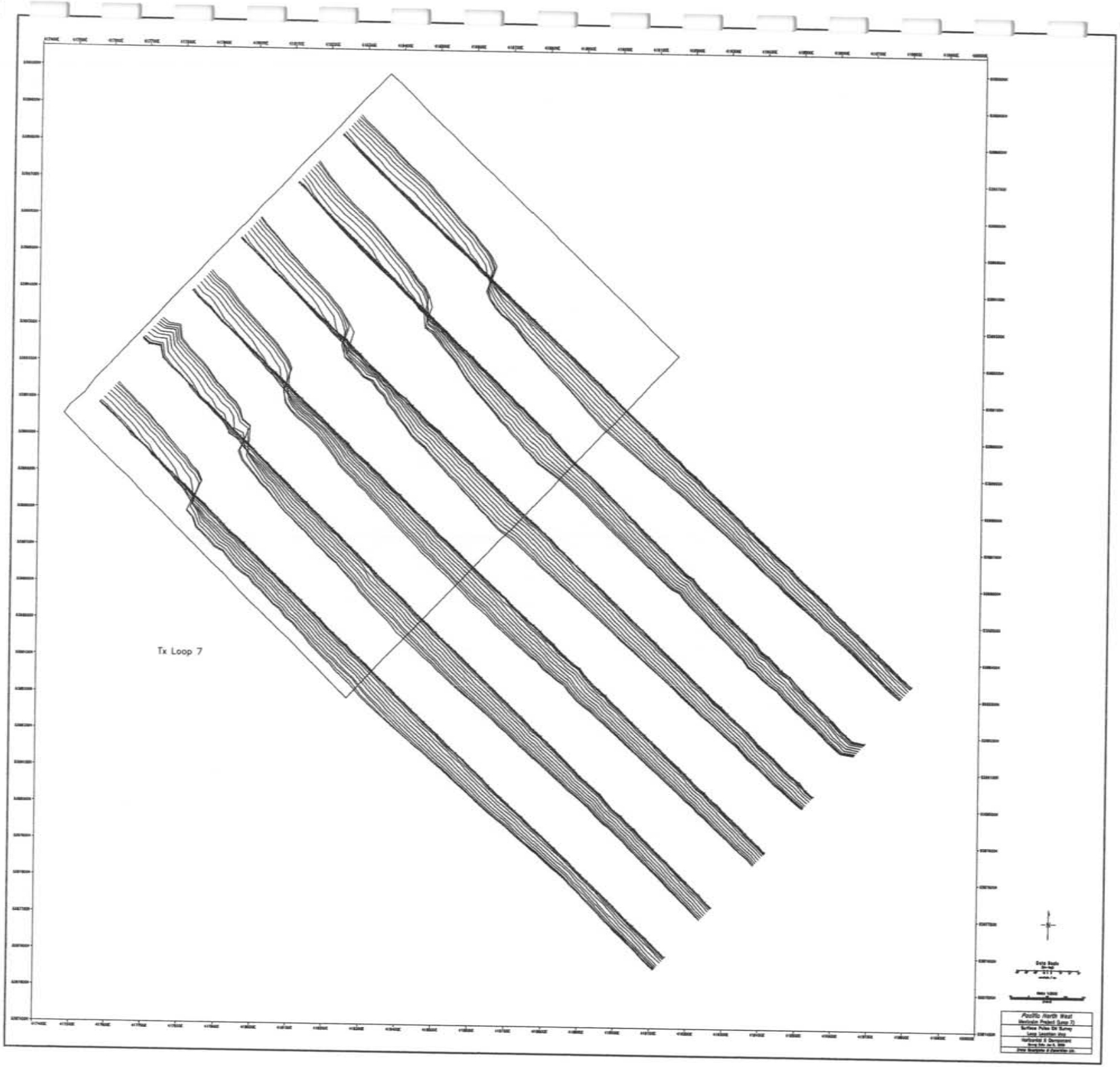
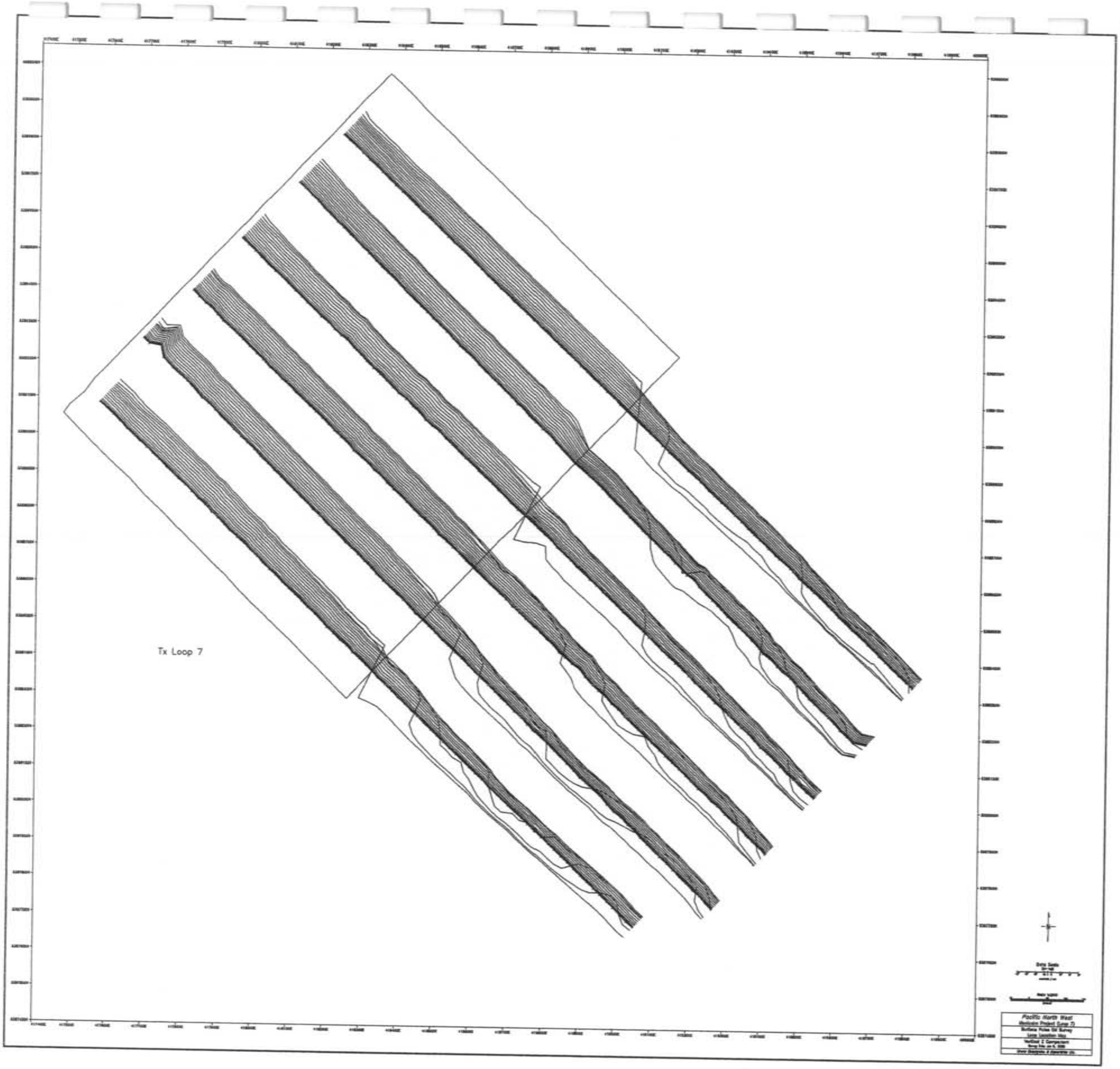
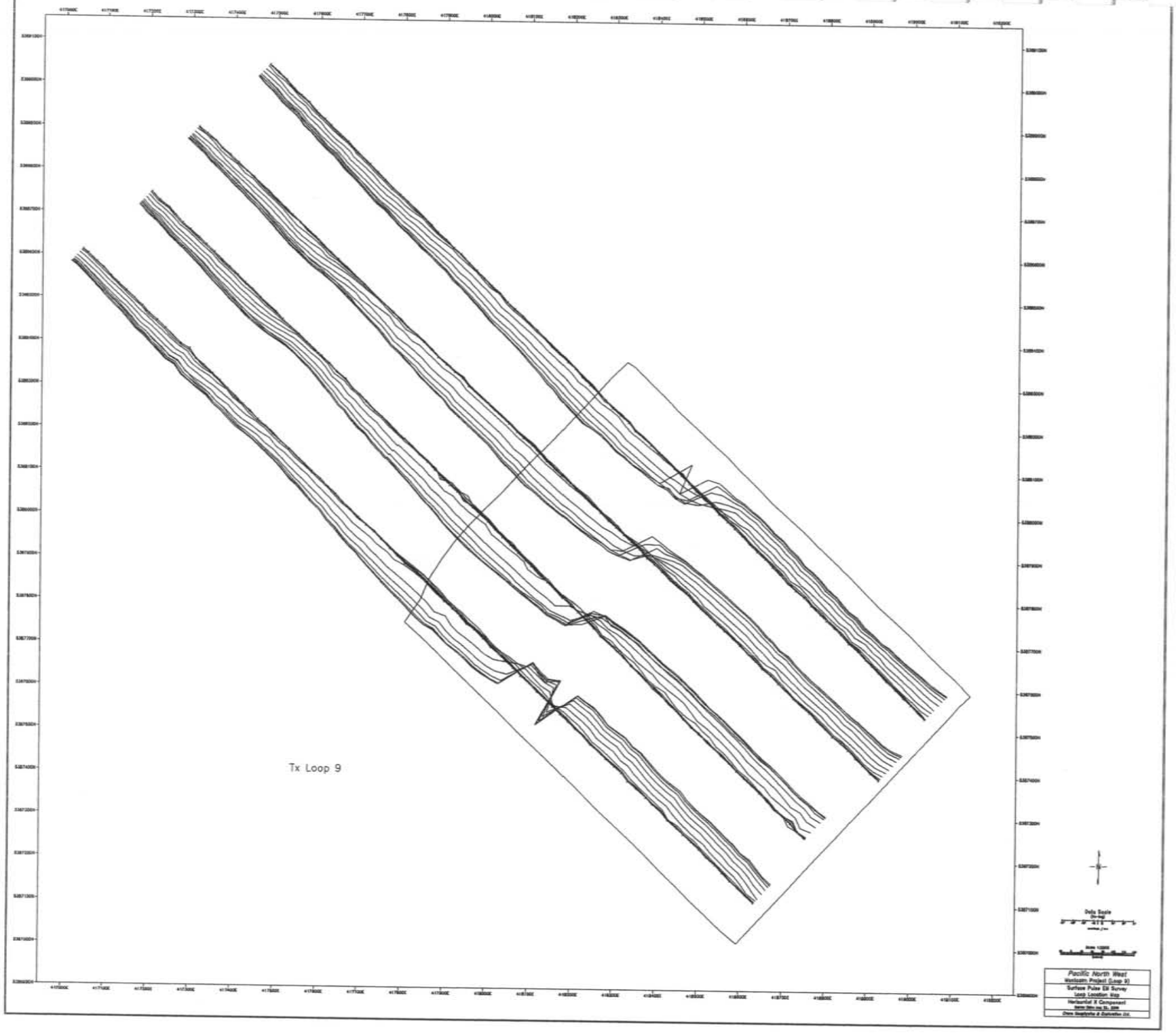

Tx Loop 6

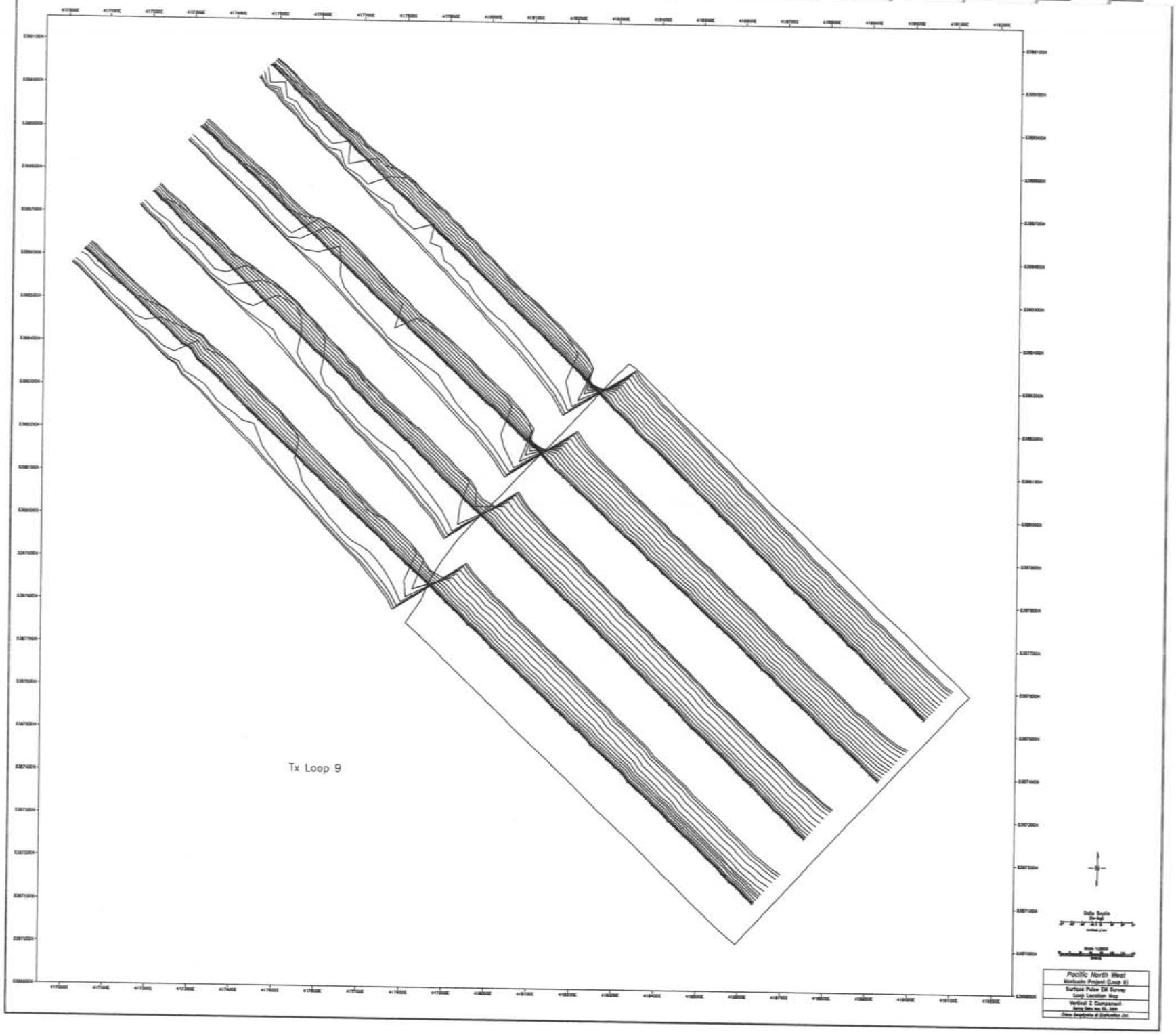


Tx Loop 6
Pacific North West
Surface Pulse EM Survey
Loop Location Map
Vertical Z Component


Tx Loop 7
Pacific North West
Meridian Project Surge 71
Surface Pulse EM Survey

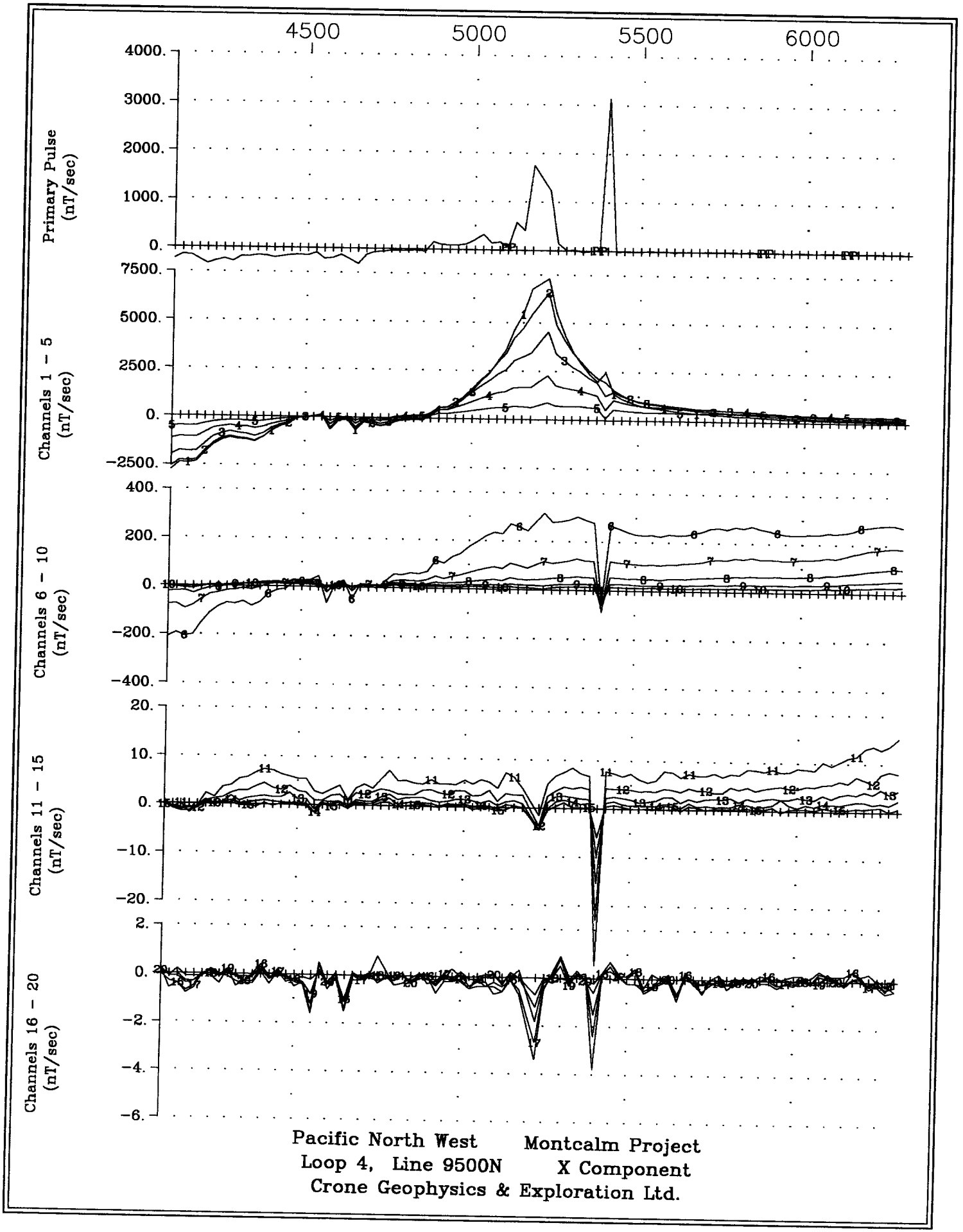

Tx Loop 7
Pacific North West
Surface Pulse EM Survey
Vertical Z Component


Tx Loop 9
Pacific North West
Surface Pulse EM Survey
Loop Location Map
Horizontal X Component

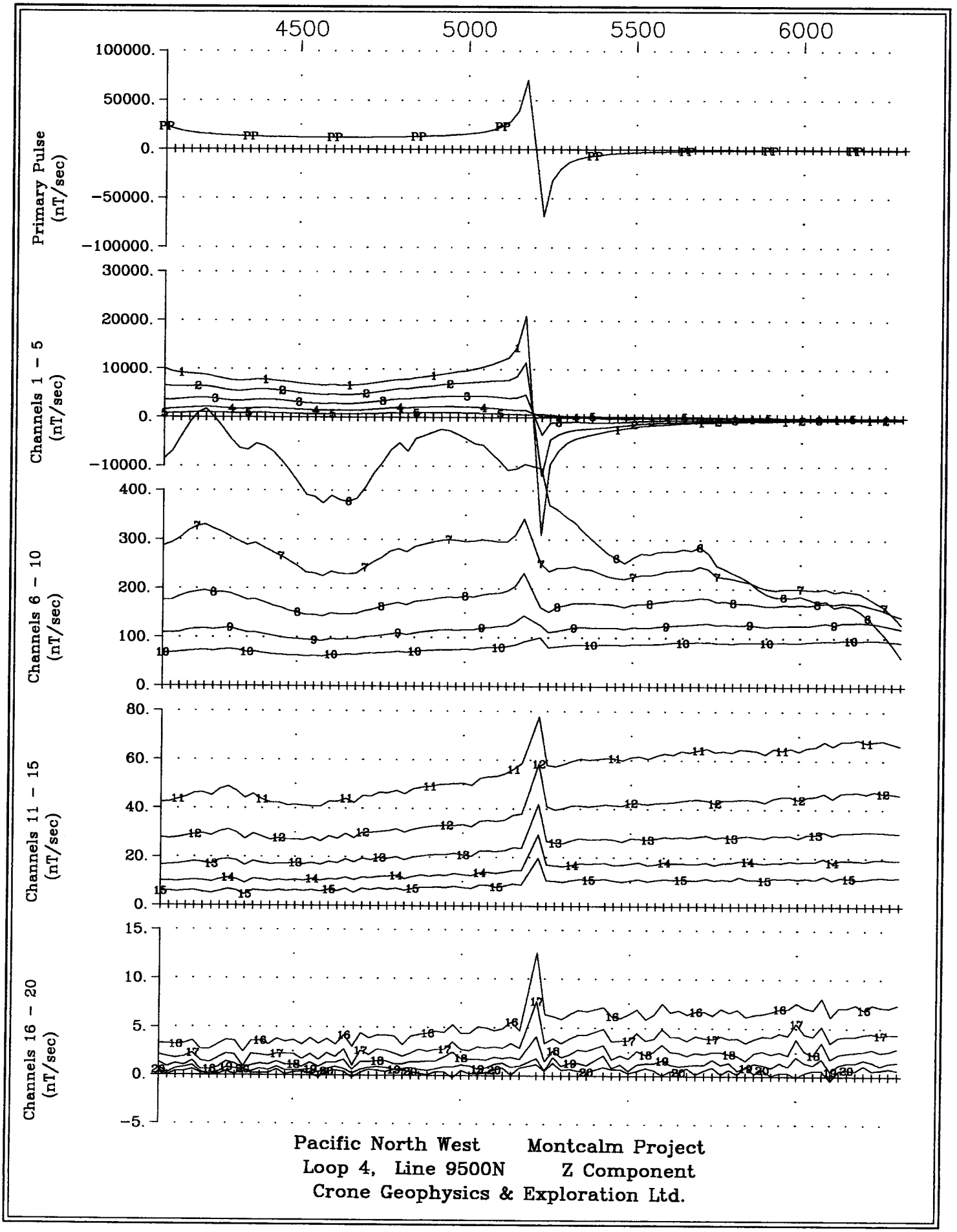

Tx Loop 9
Pacific North West
Montcalm Project (Loop 9)
Surface Pulse EM Survey
Loop Location Map
Vertical Z Component

APPENDIX II

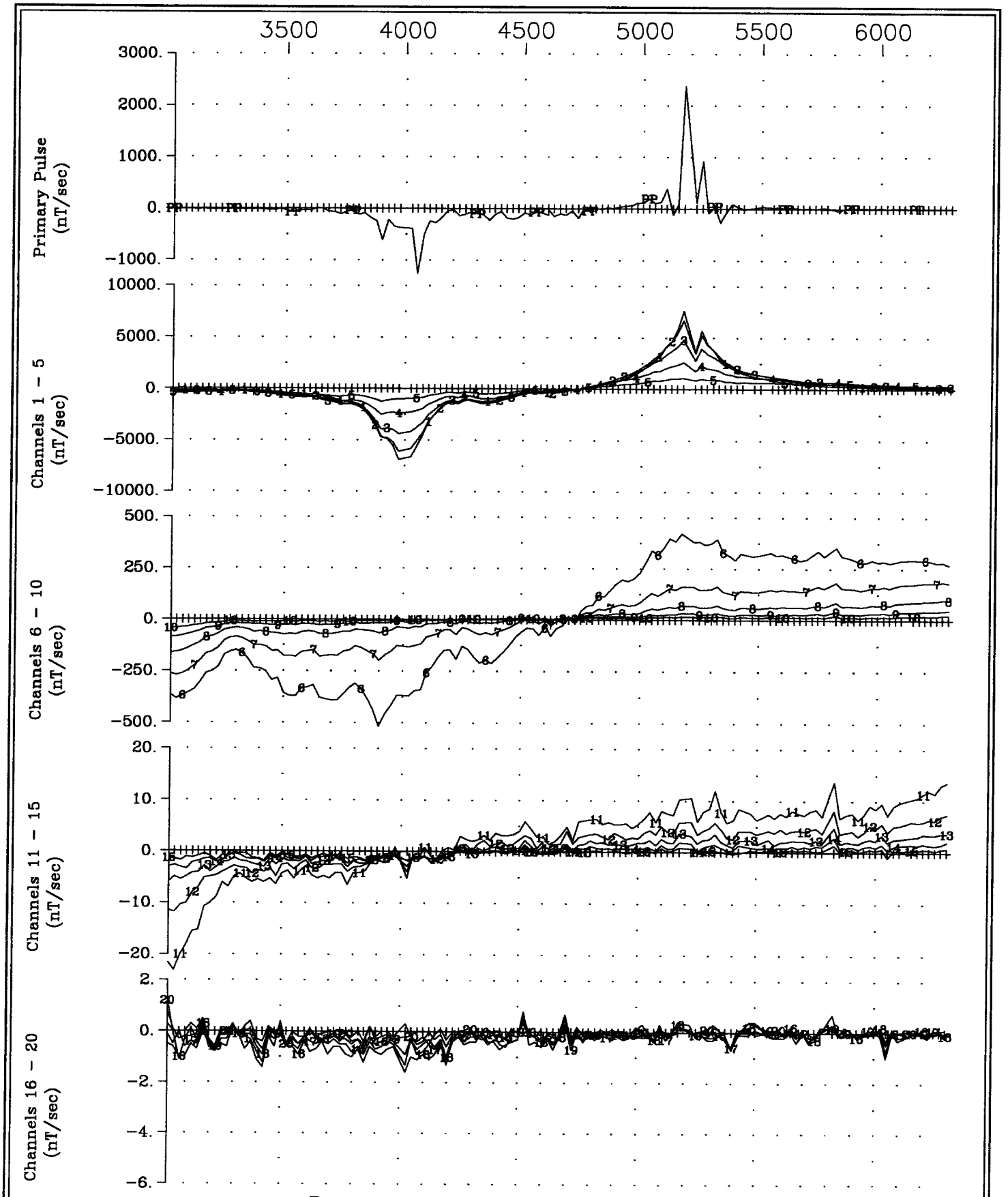
LINEAR (5-AXIS) PULSE EM DATA PROFILES



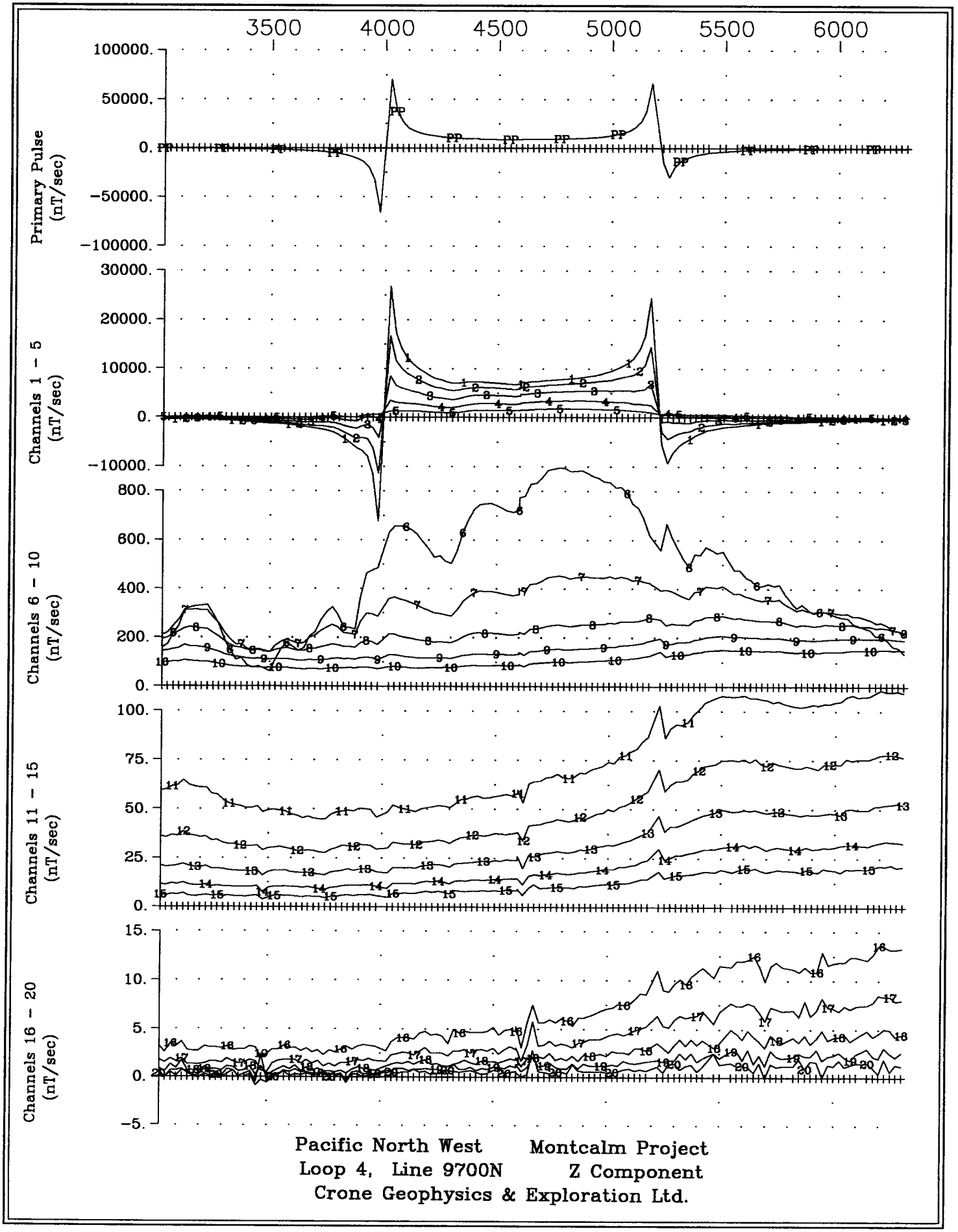
Pacific North West Montcalm Project
Loop 4, Line 9500N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 9500N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 9700N X Component
Crone Geophysics & Exploration Ltd.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4000
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5000
5500
6000
Primary Pulse (nT/sec)
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50000.
0.
-50000.
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PP
Channels 1 - 5 (nT/sec)
30000.
20000.
10000.
0.
-10000.
Channels 6 - 10 (nT/sec)
800.
600.
400.
200.
0.
Channels 11 - 15 (nT/sec)
100.
75.
50.
25.
0.
Channels 16 - 20 (nT/sec)
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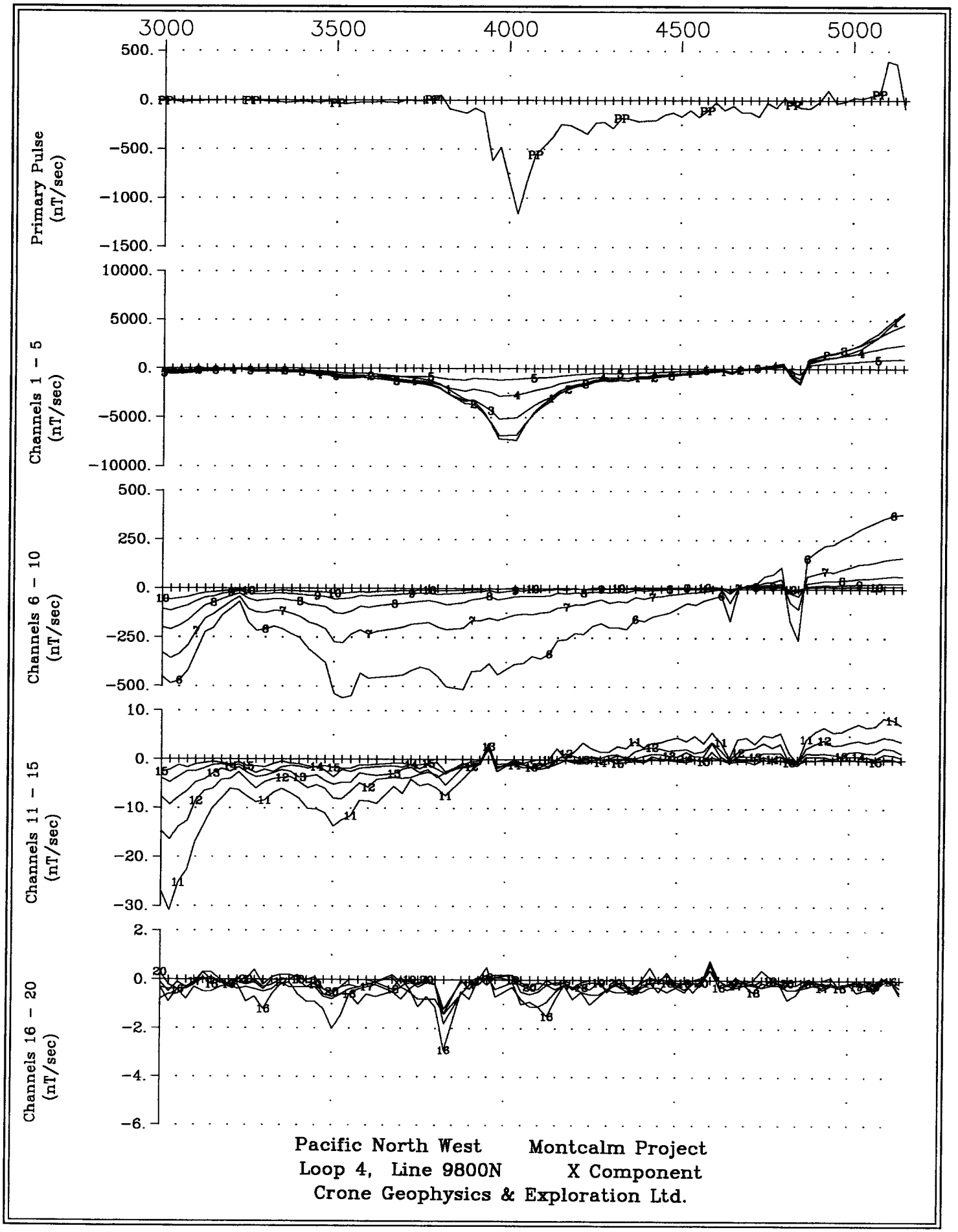
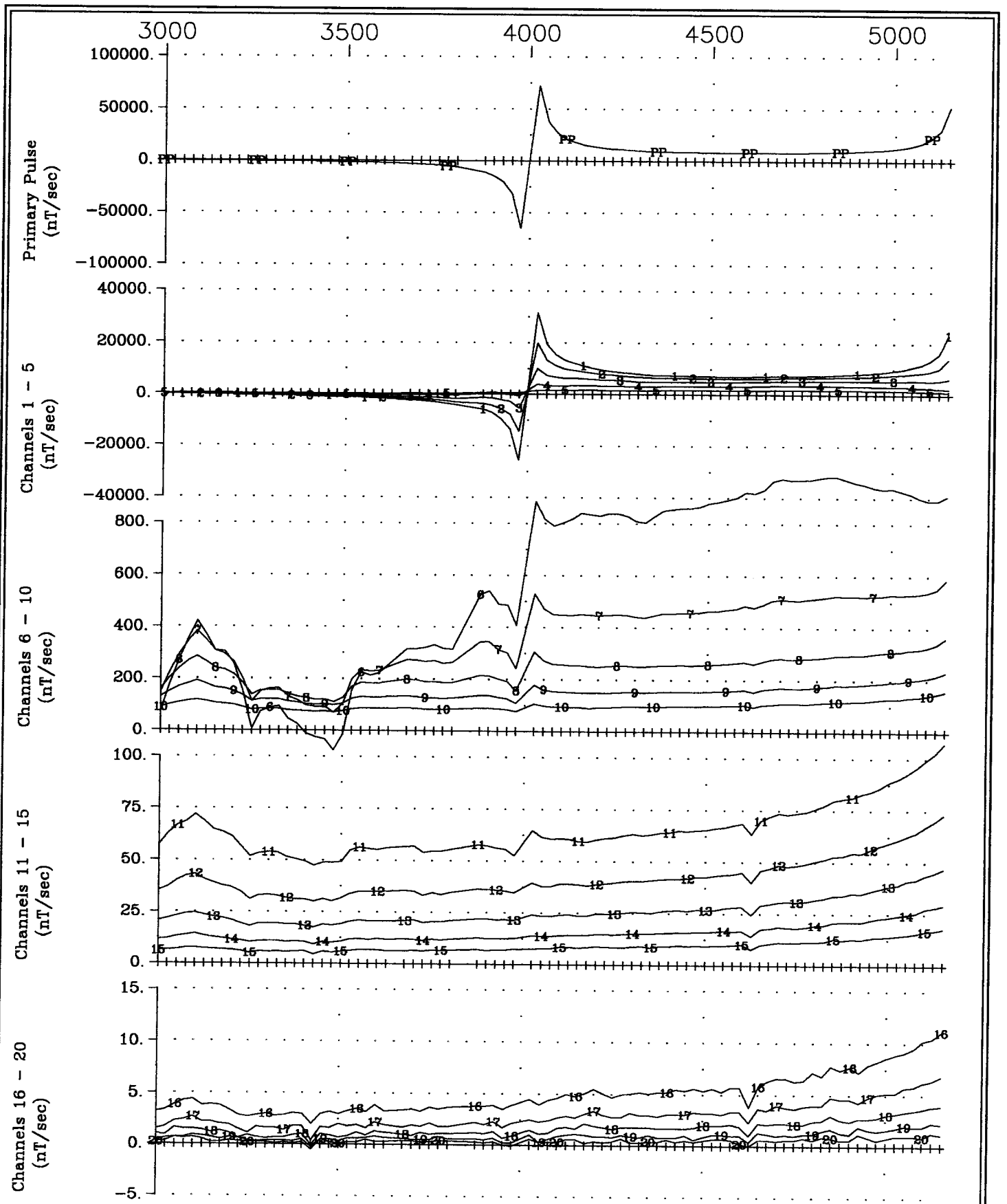
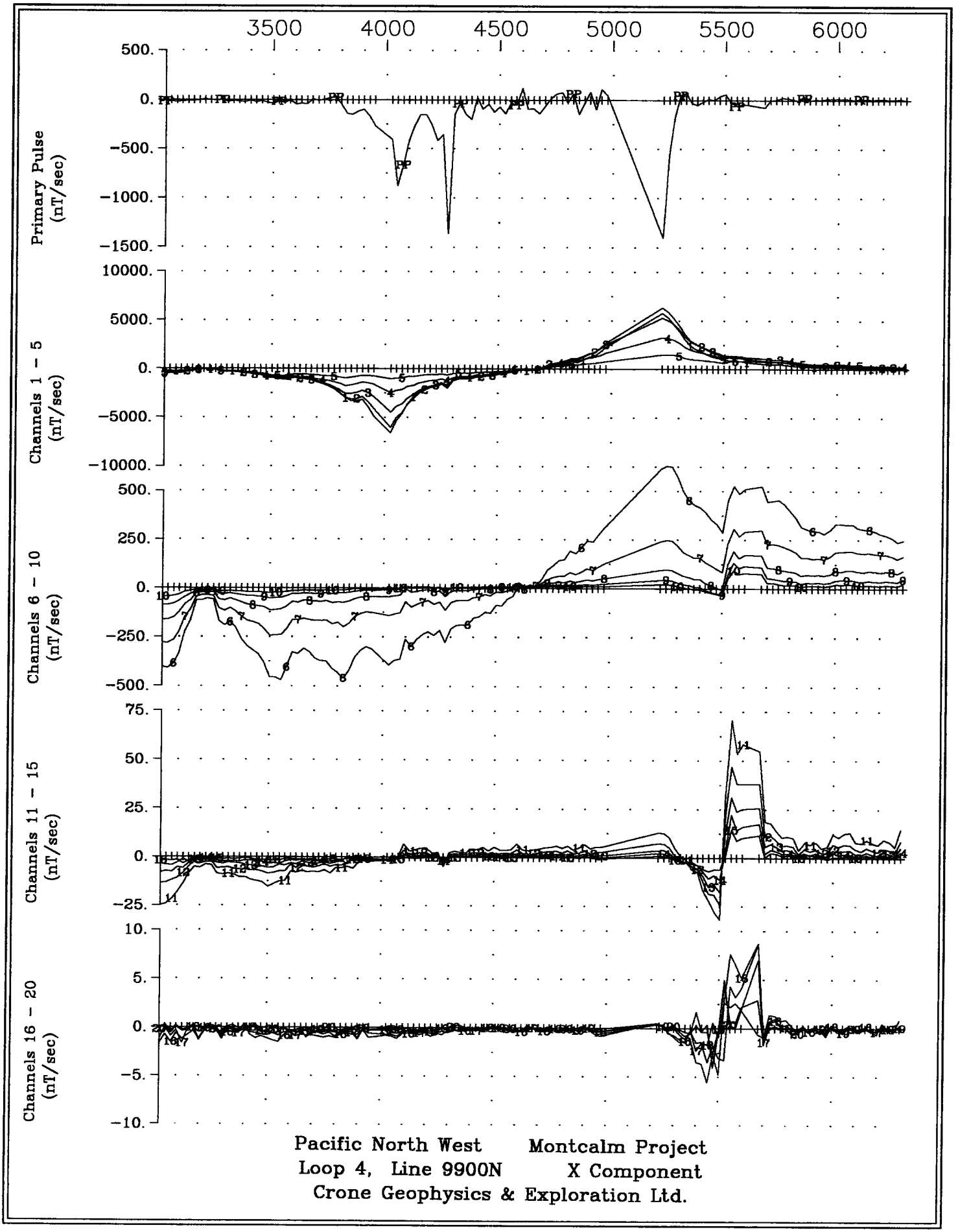
Pacific North West Montcalm Project
Loop 4, Line 9700N Z Component
Crone Geophysics & Exploration Ltd.



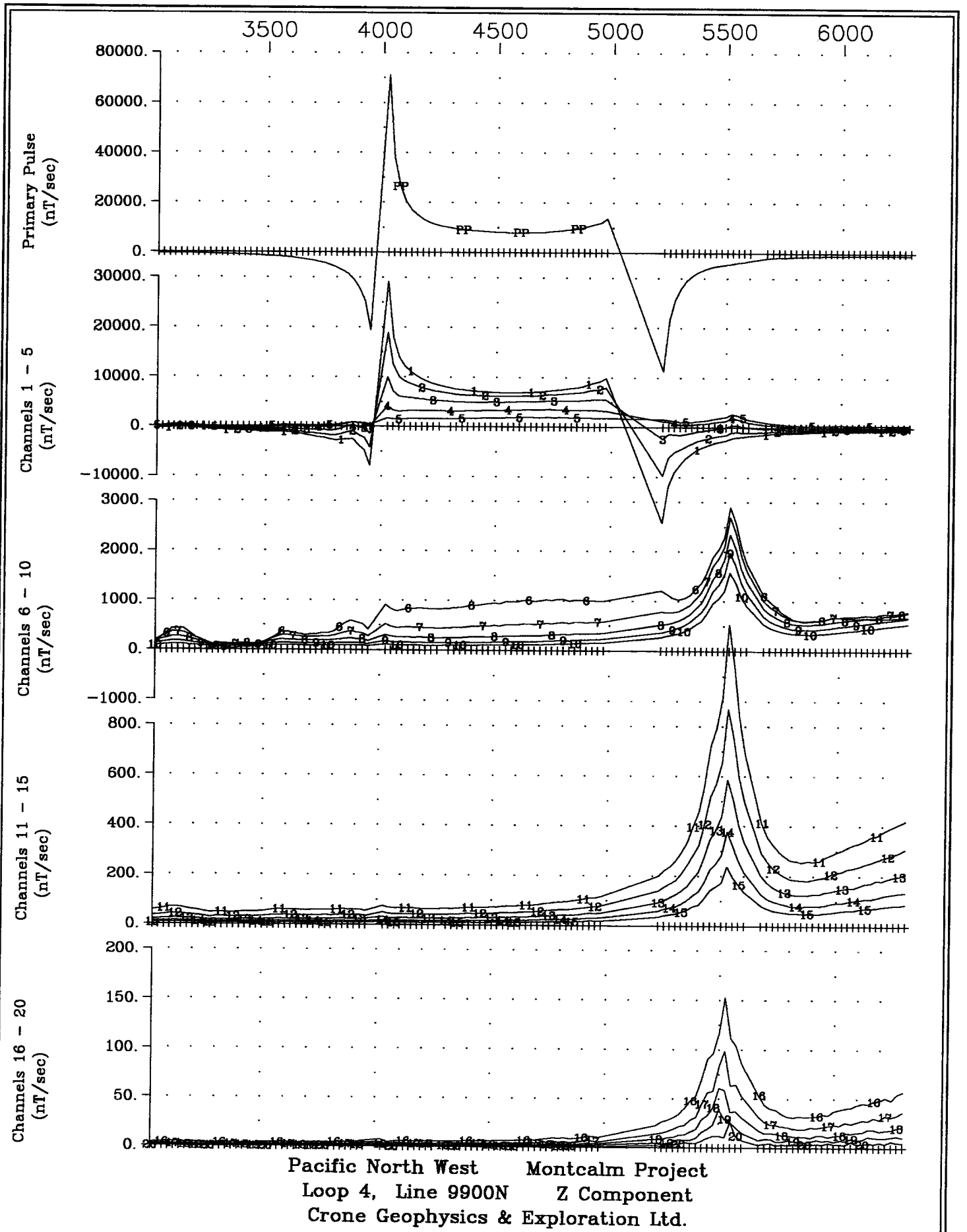
Pacific North West Montcalm Project
Loop 4, Line 9800N X Component
Crone Geophysics & Exploration Ltd.



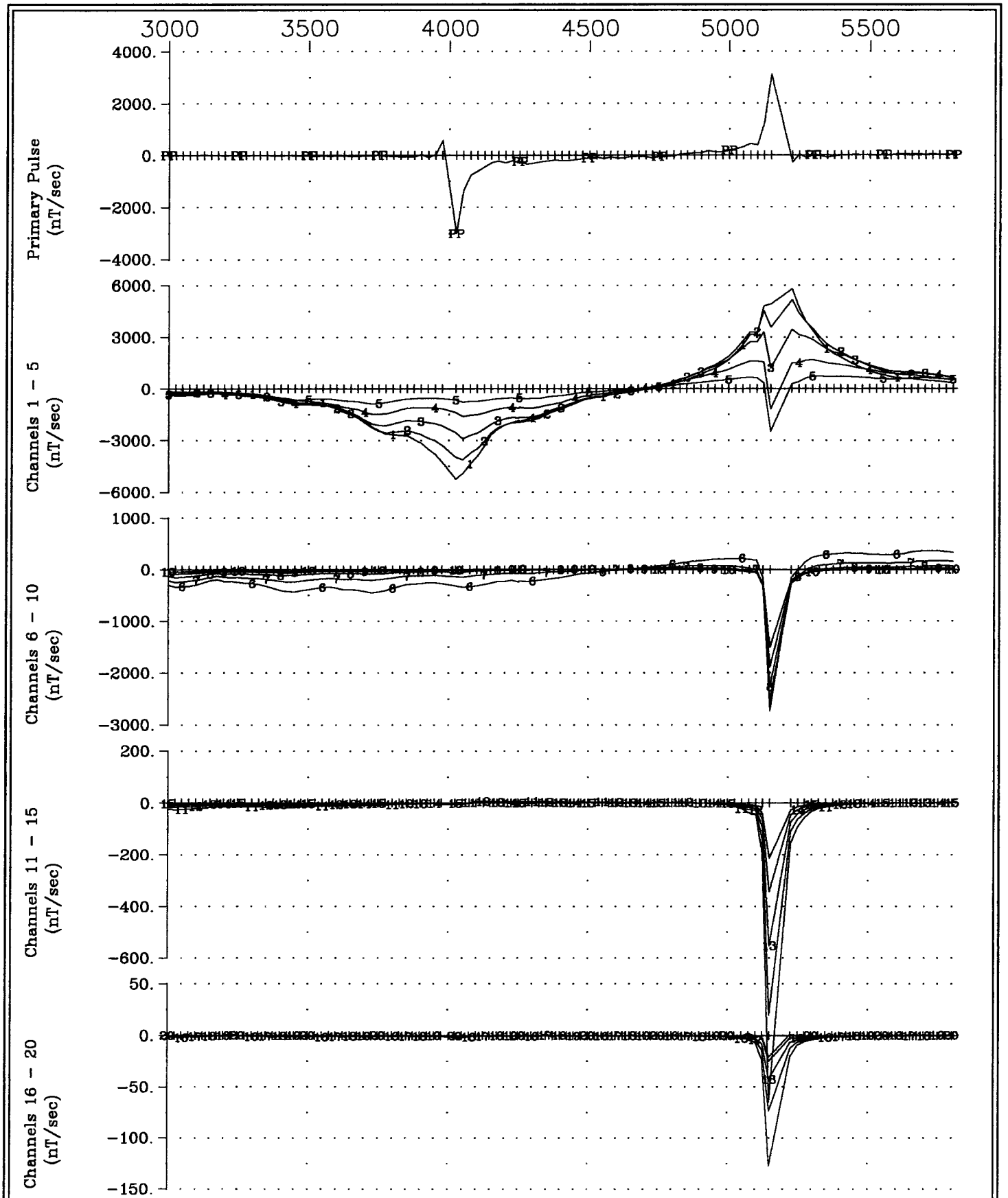
Pacific North West Montcalm Project
Loop 4, Line 9800N Z Component
Crone Geophysics & Exploration Ltd.



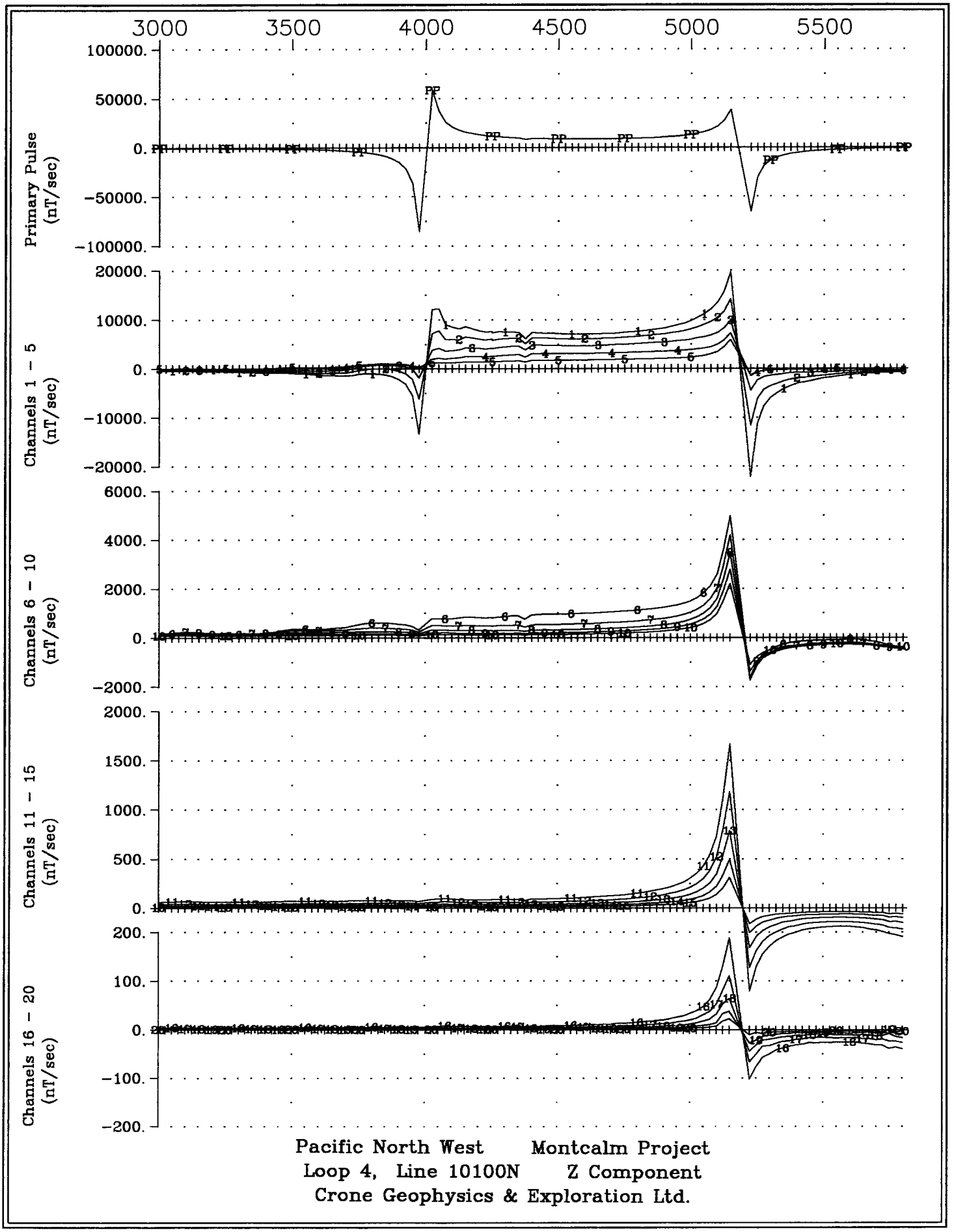
Pacific North West Montcalm Project
Loop 4, Line 9900N X Component
Crone Geophysics & Exploration Ltd.



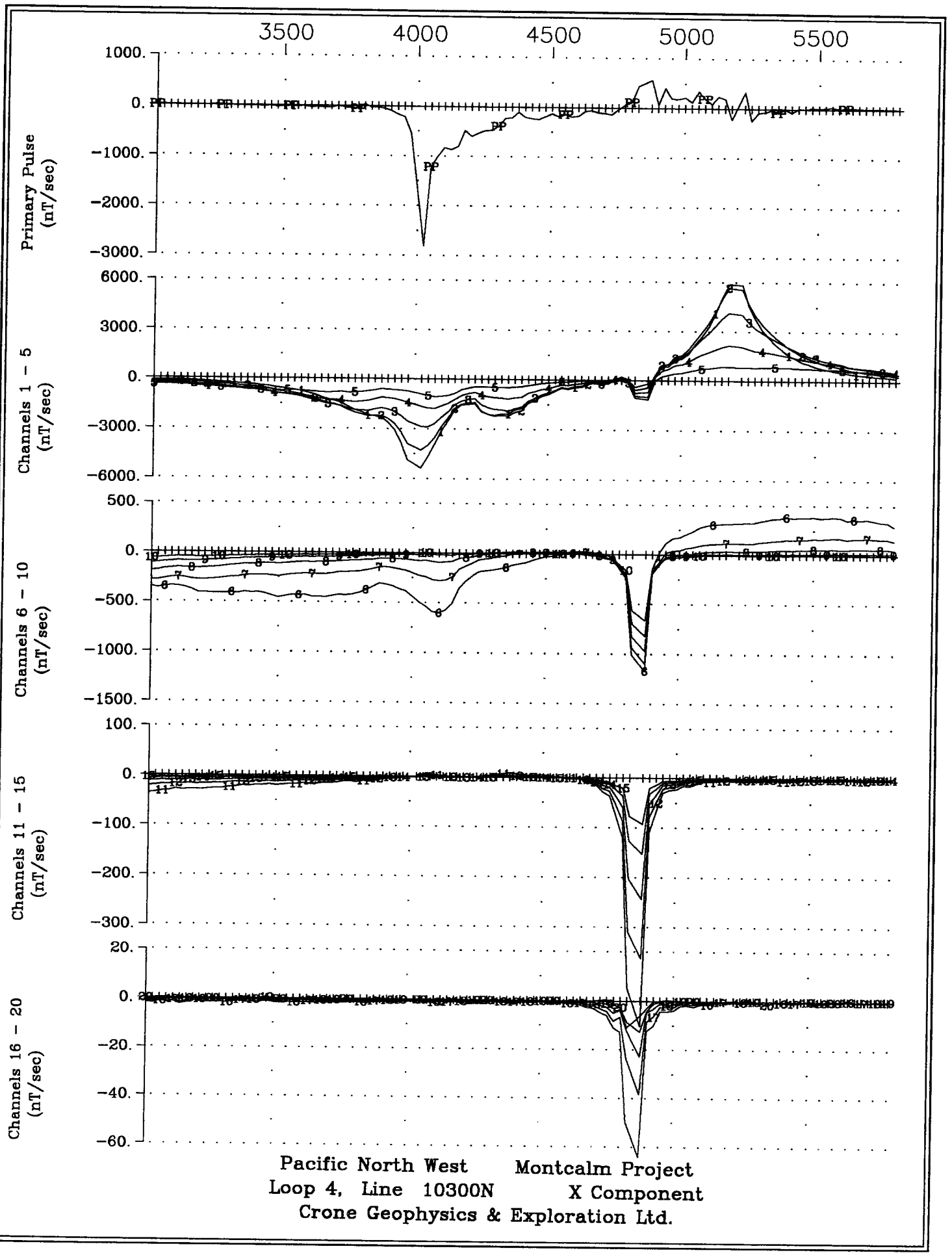
Pacific North West Montcalm Project
Loop 4, Line 9900N Z Component
Crone Geophysics & Exploration Ltd.



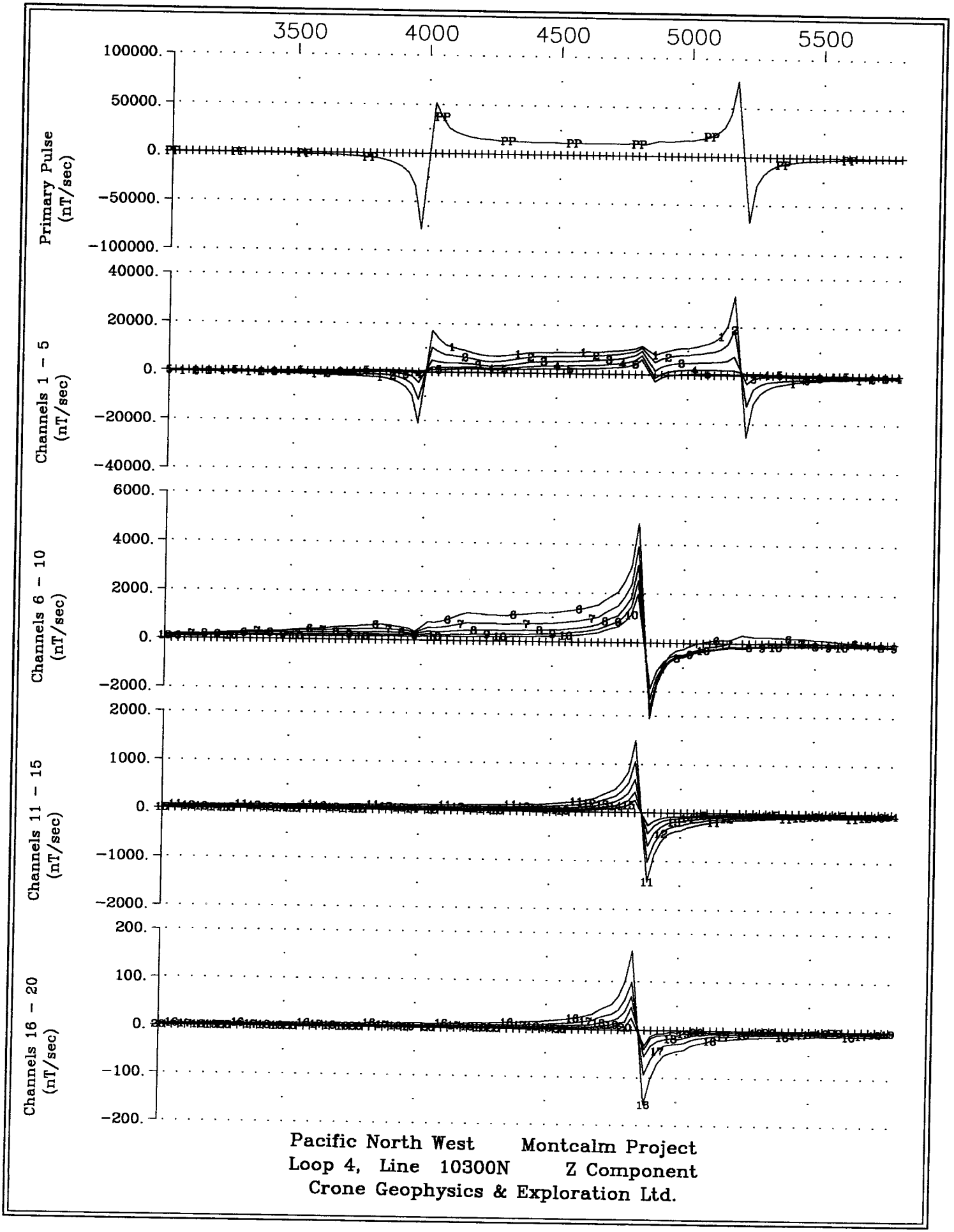
Pacific North West Montcalm Project
Loop 4, Line 10100N X Component
Crone Geophysics & Exploration Ltd.



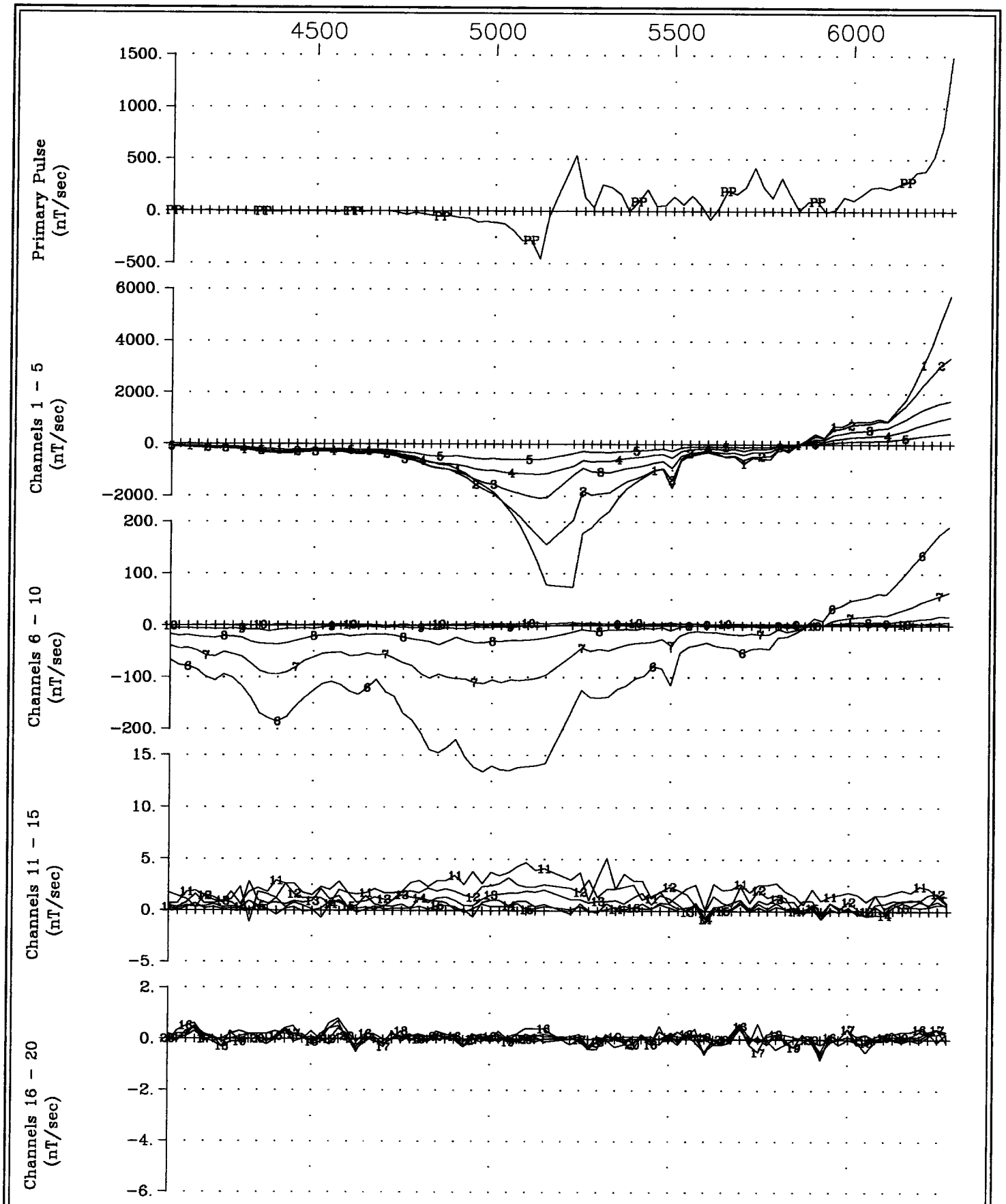
Pacific North West Montcalm Project
Loop 4, Line 10100N Z Component
Crone Geophysics & Exploration Ltd.



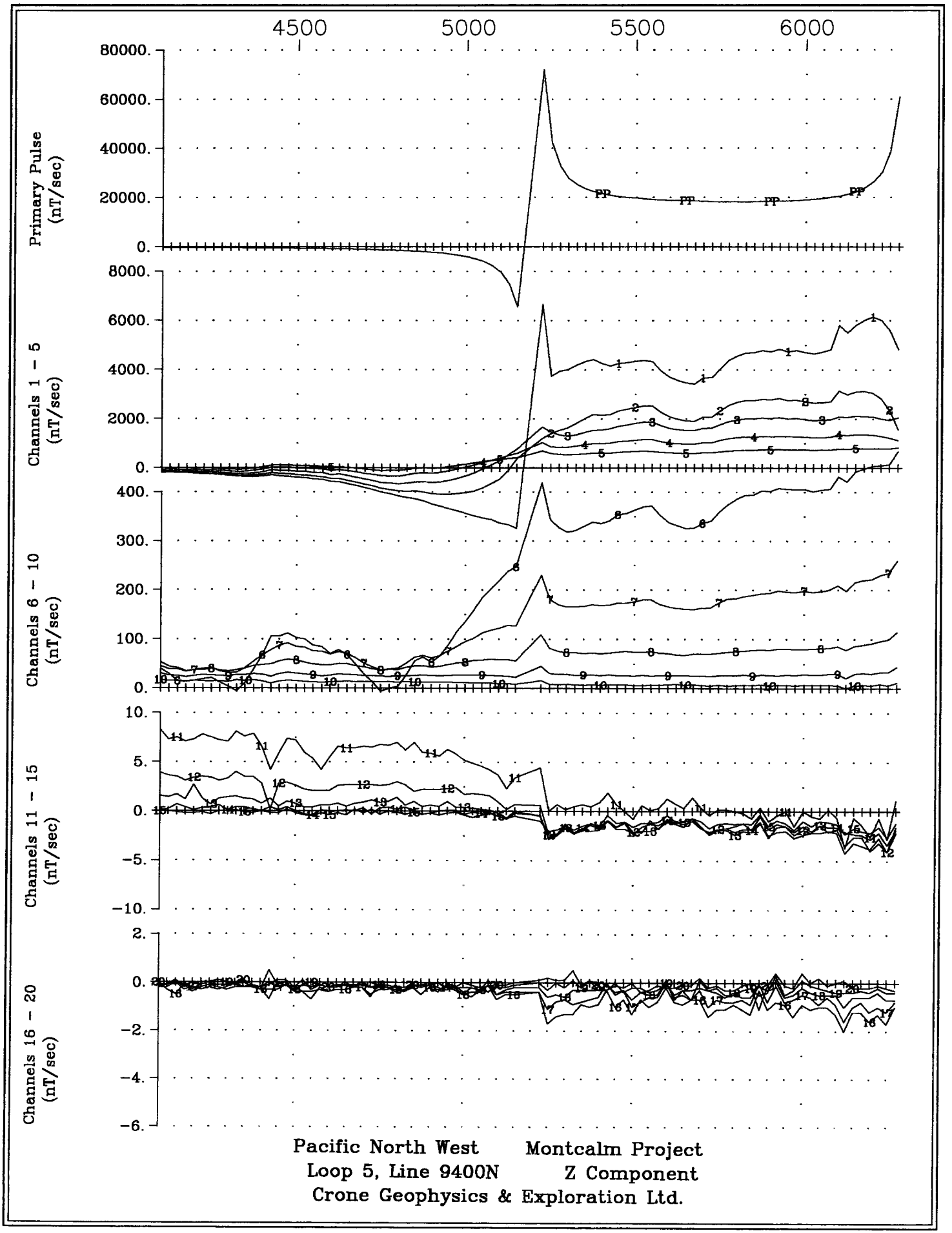
Pacific North West Montcalm Project
Loop 4, Line 10300N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 10300N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 5, Line 9400N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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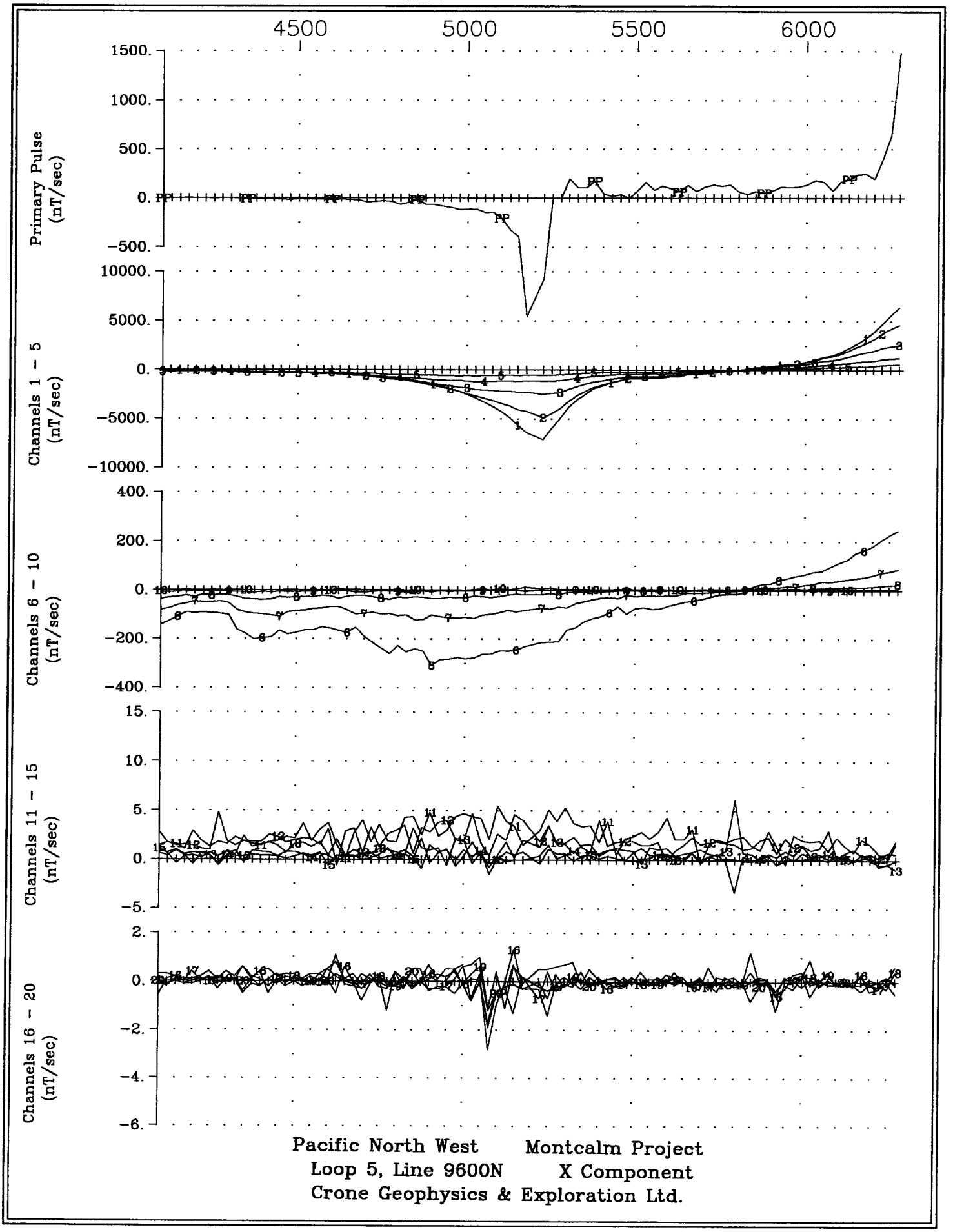
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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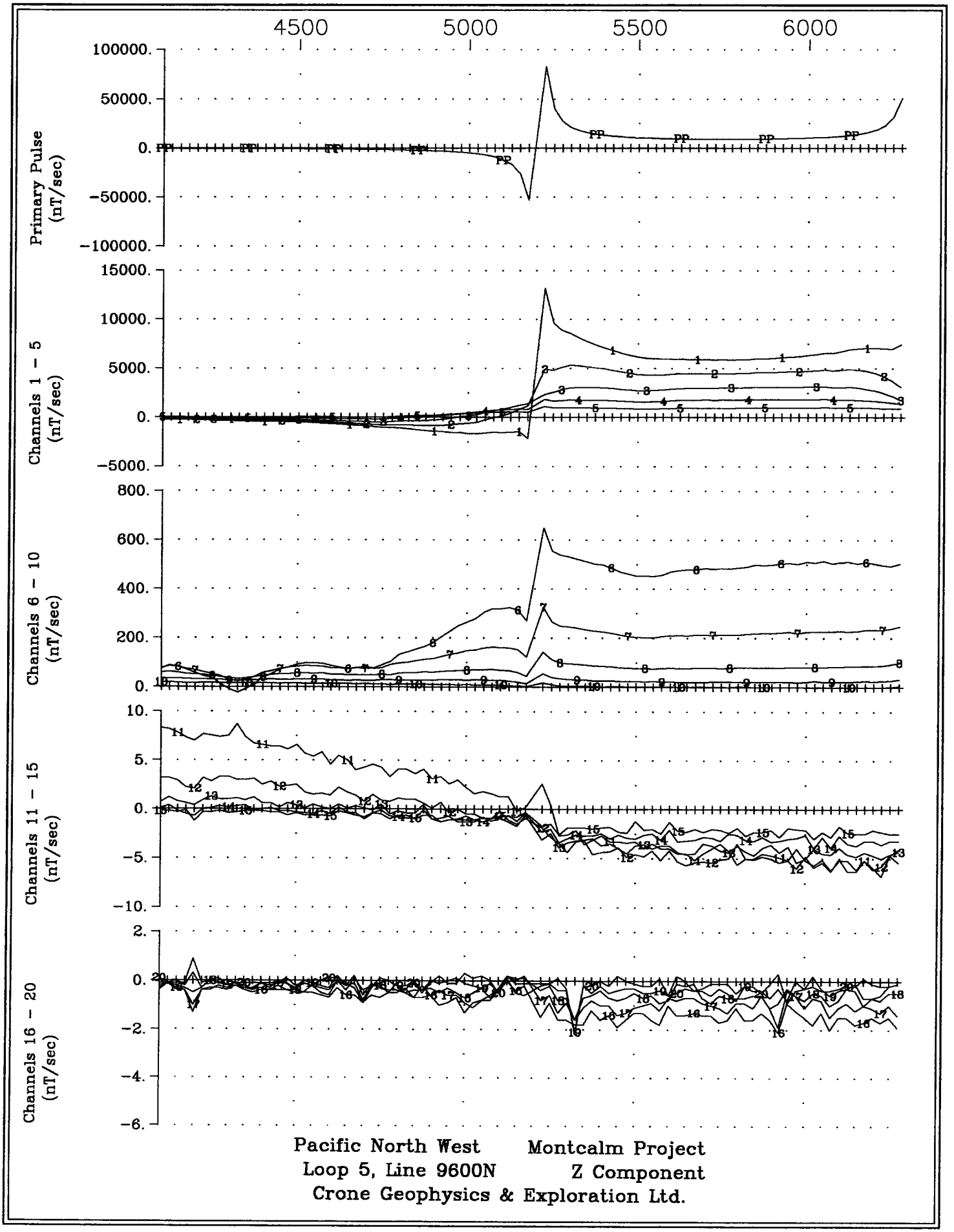
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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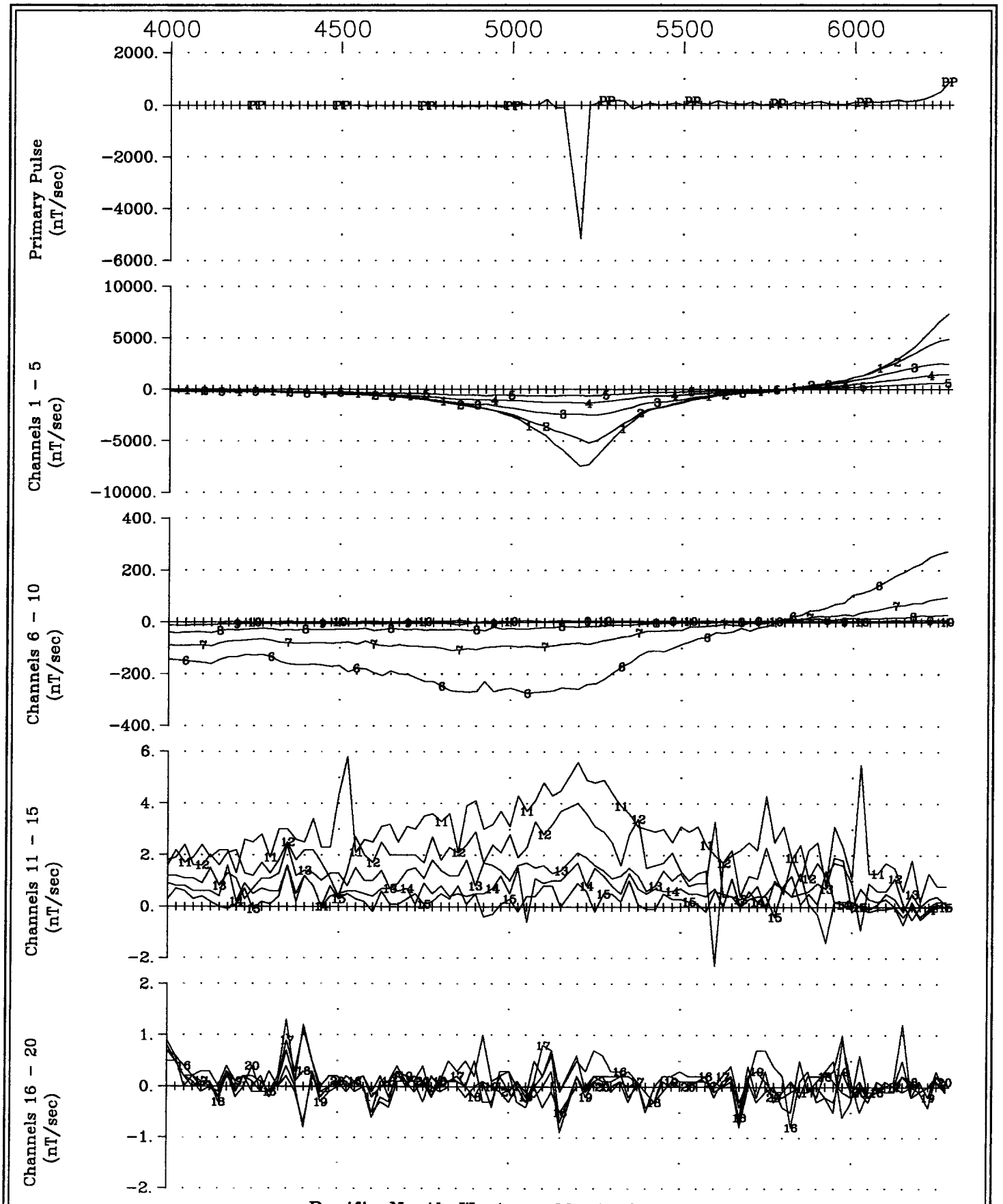
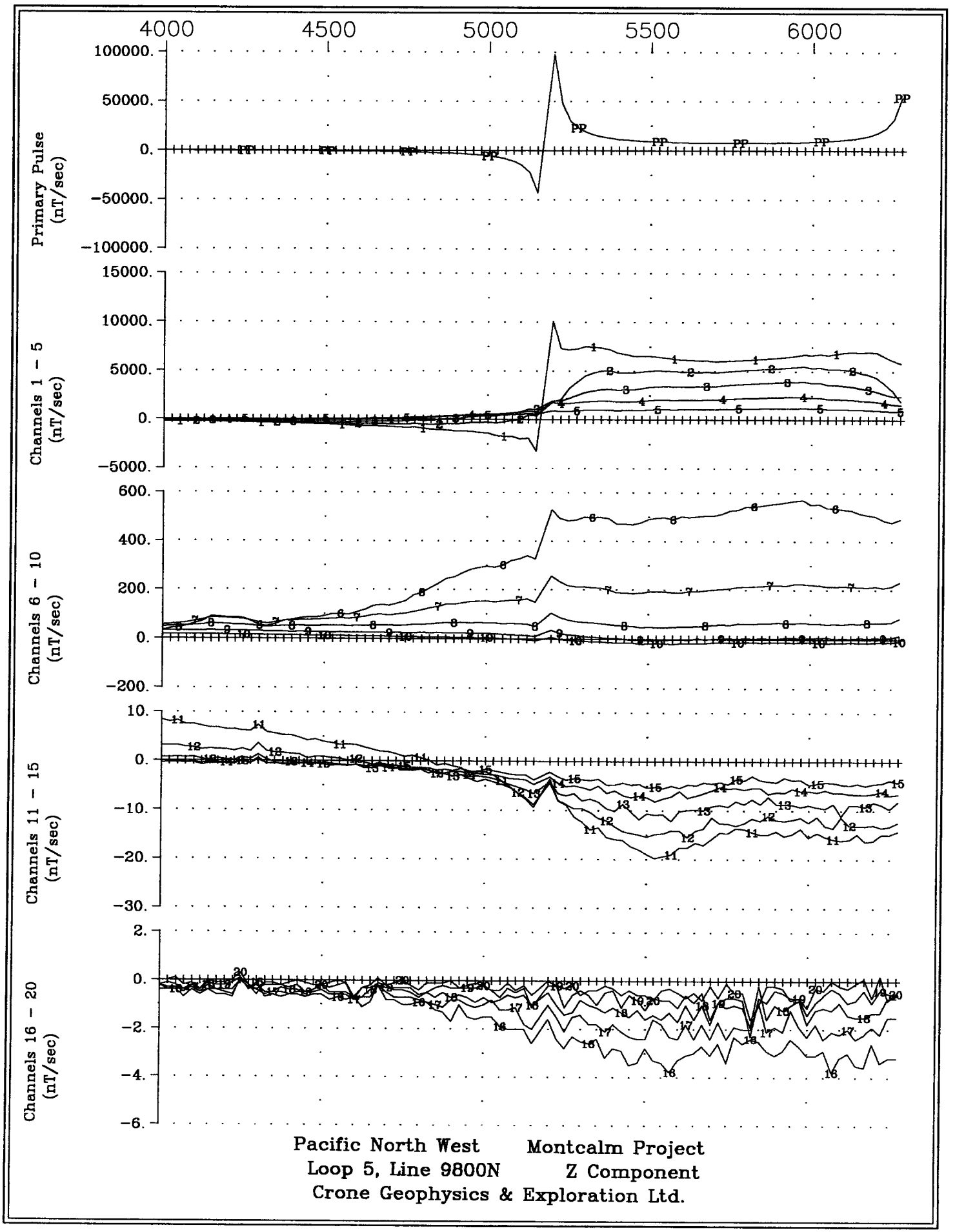
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 5, Line 9800N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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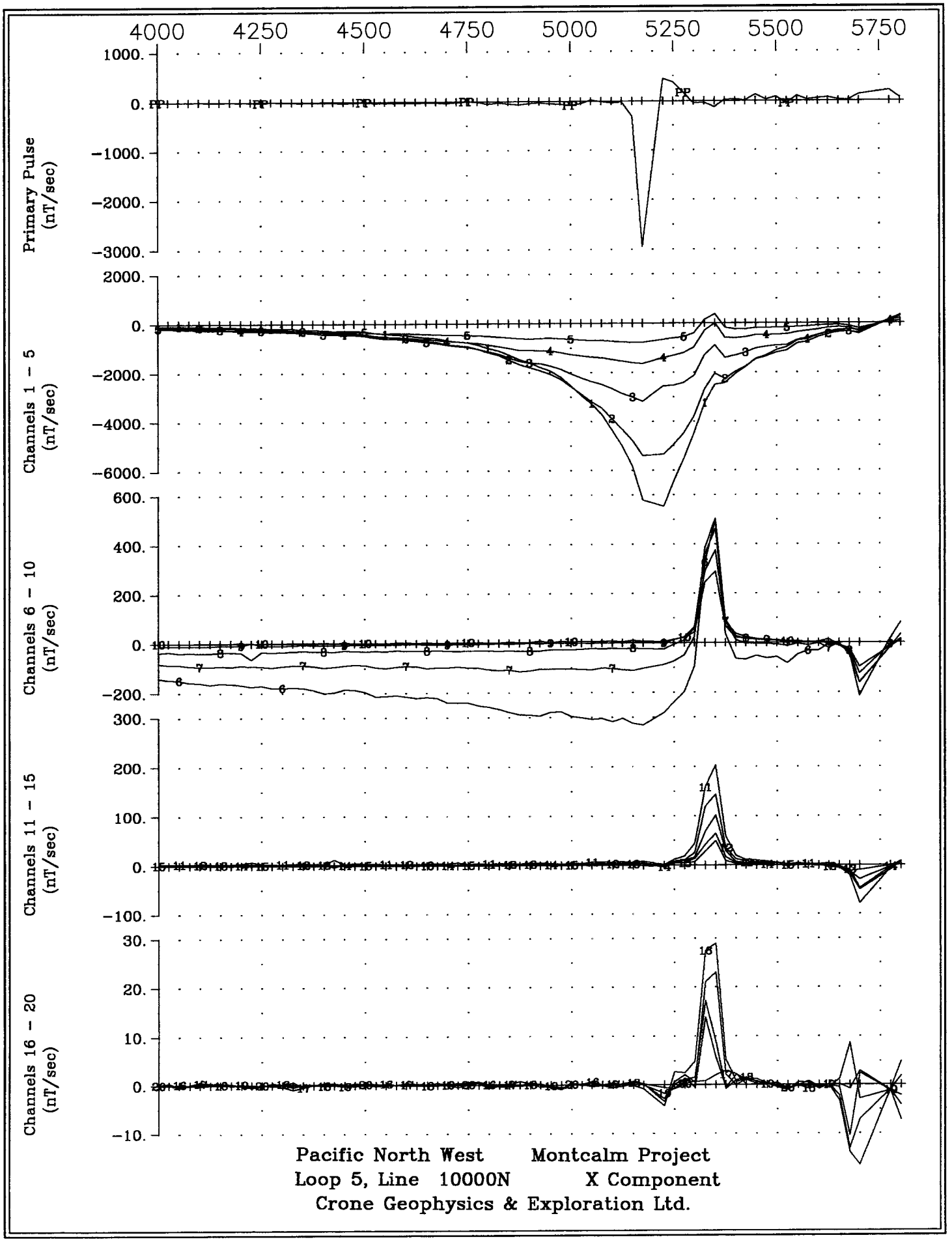
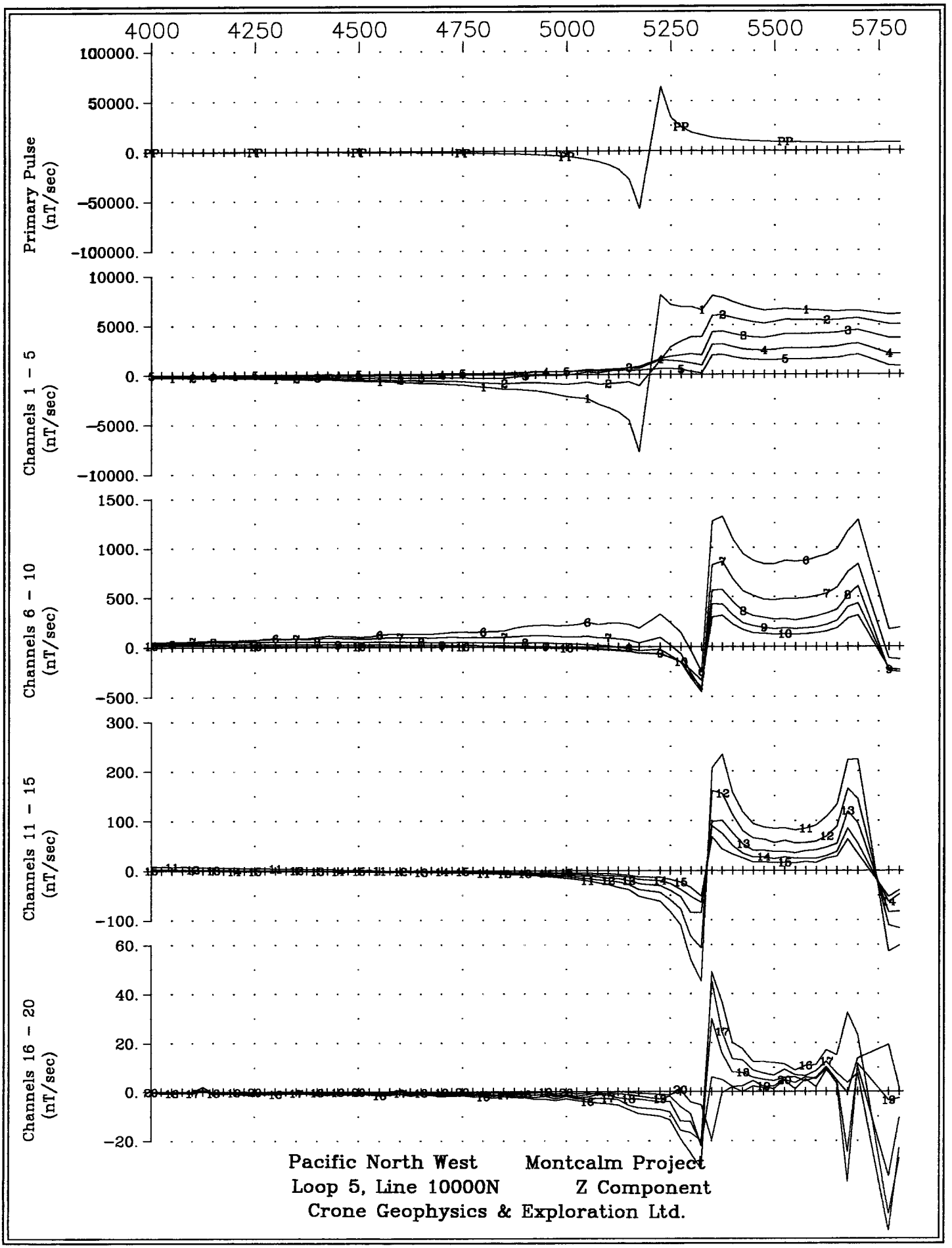
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 5, Line 10000N X Component
Crone Geophysics & Exploration Ltd.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4250
4500
4750
5000
5250
5500
5750
Primary Pulse (nT/sec)
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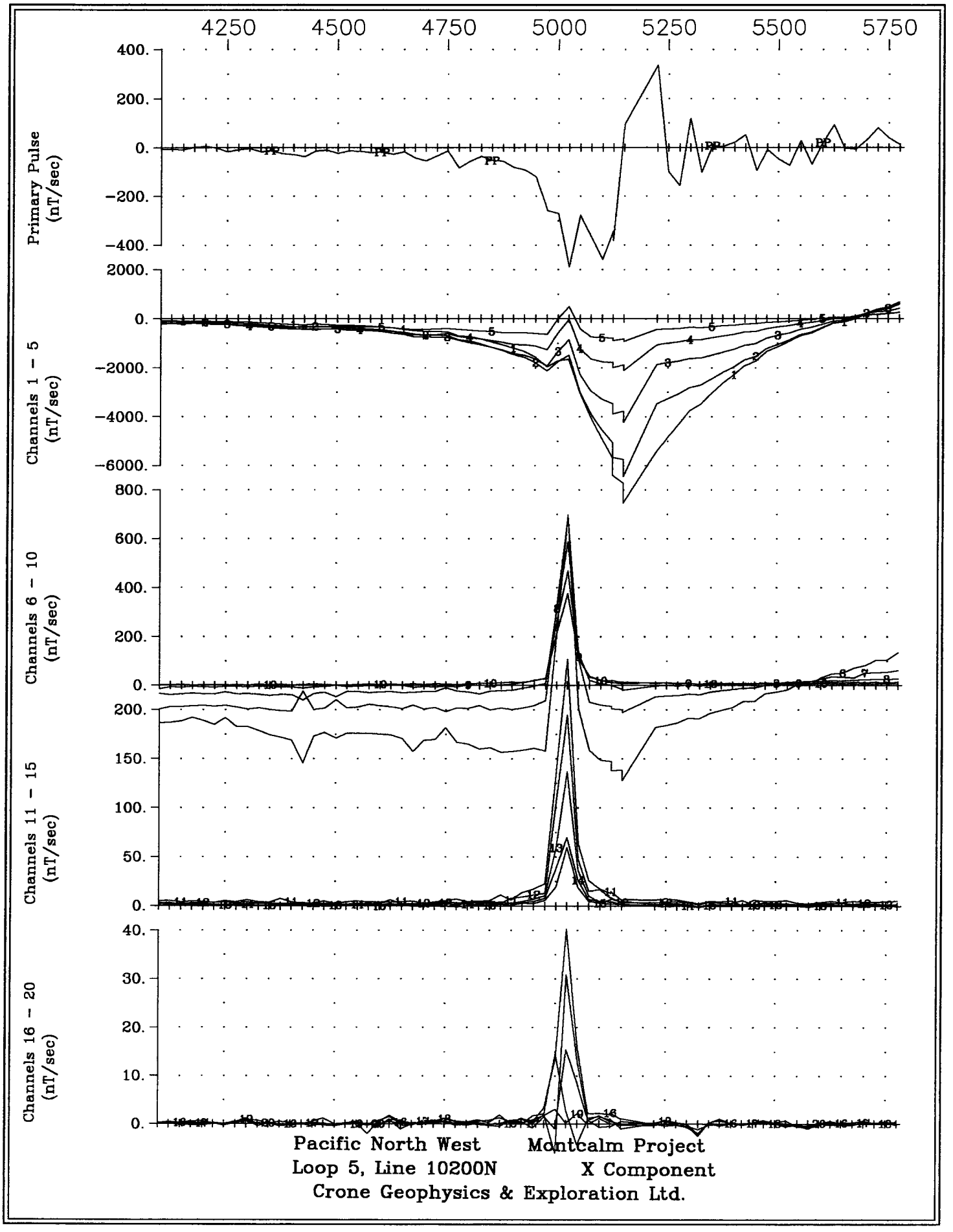
50000.
0.
-50000.
-100000.
PP
Channels 1 - 5 (nT/sec)
10000.
5000.
0.
-5000.
-10000.
Channels 6 - 10 (nT/sec)
1500.
1000.
500.
0.
-500.
Channels 11 - 15 (nT/sec)
300.
200.
100.
0.
-100.
Channels 16 - 20 (nT/sec)
60.
40.
20.
0.
-20.
Pacific North West Montcalm Project
Loop 5, Line 10000N Z Component
Crone Geophysics & Exploration Ltd.


4250
4500
4750
5000
5250
5500
5750
Primary Pulse (nT/sec)
400.
200.
0.
-200.
-400.
PP
Channels 1 - 5 (nT/sec)
2000.
0.
-2000.
-4000.
-6000.
Channels 6 - 10 (nT/sec)
800.
600.
400.
200.
0.
Channels 11 - 15 (nT/sec)
200.
150.
100.
50.
0.
Channels 16 - 20 (nT/sec)
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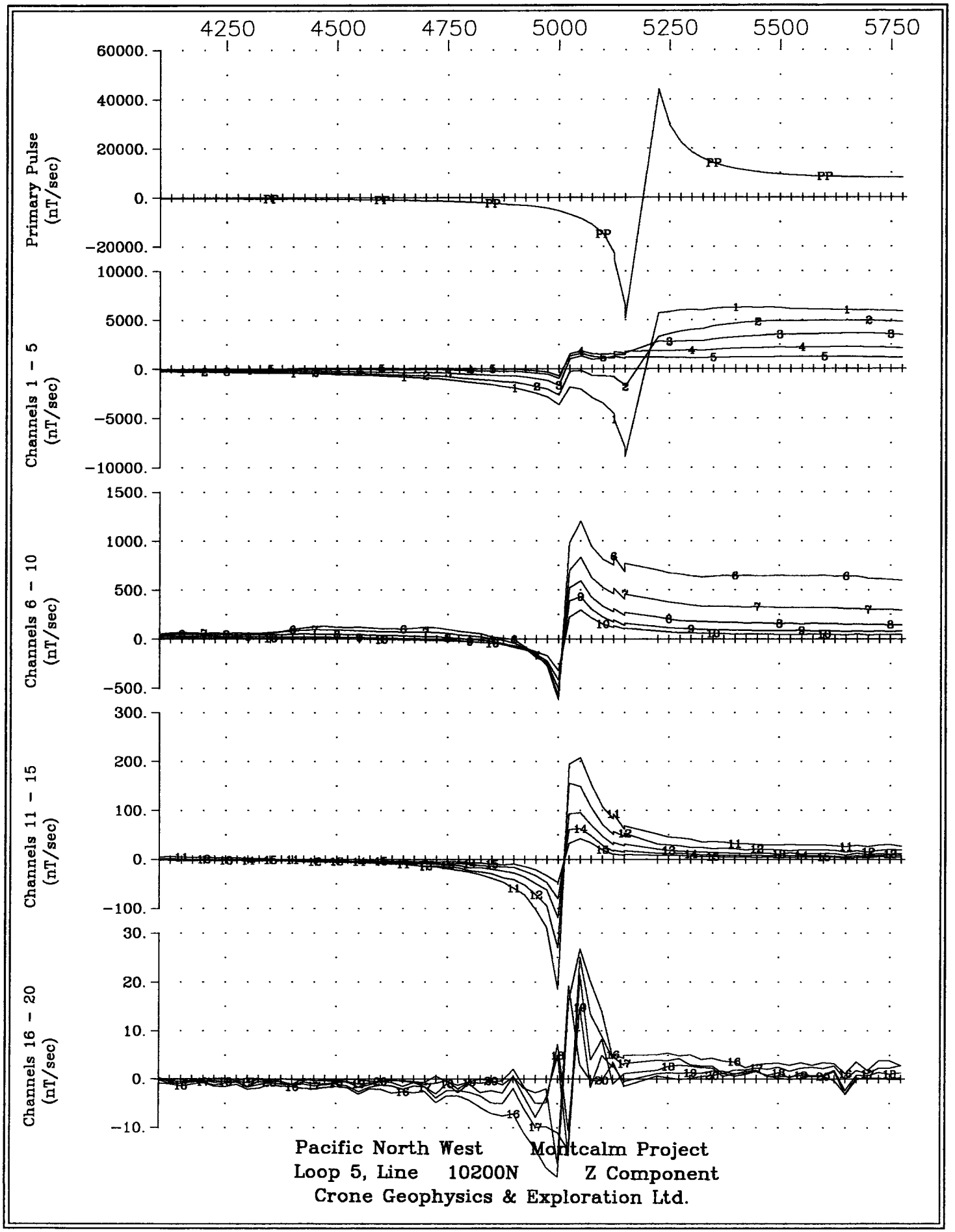
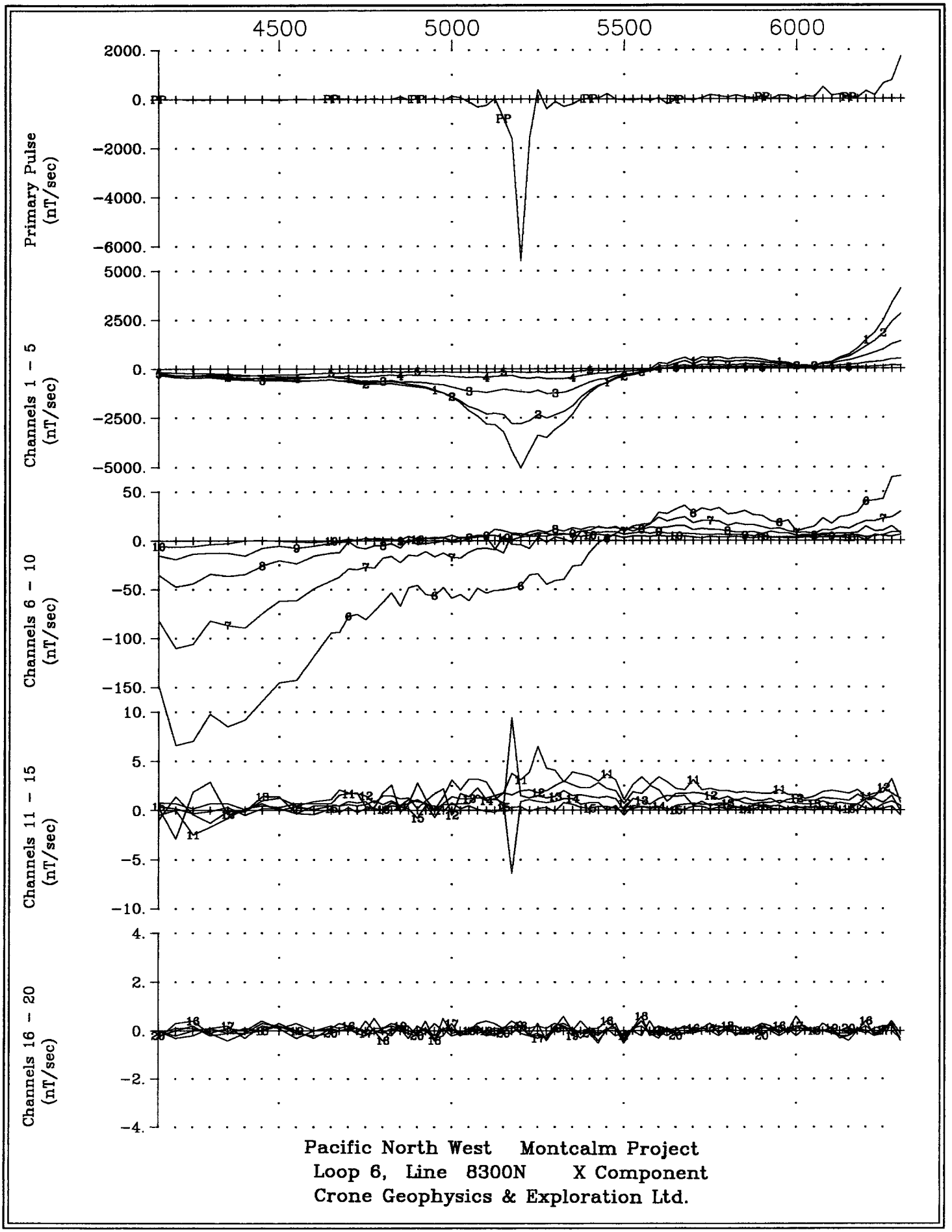
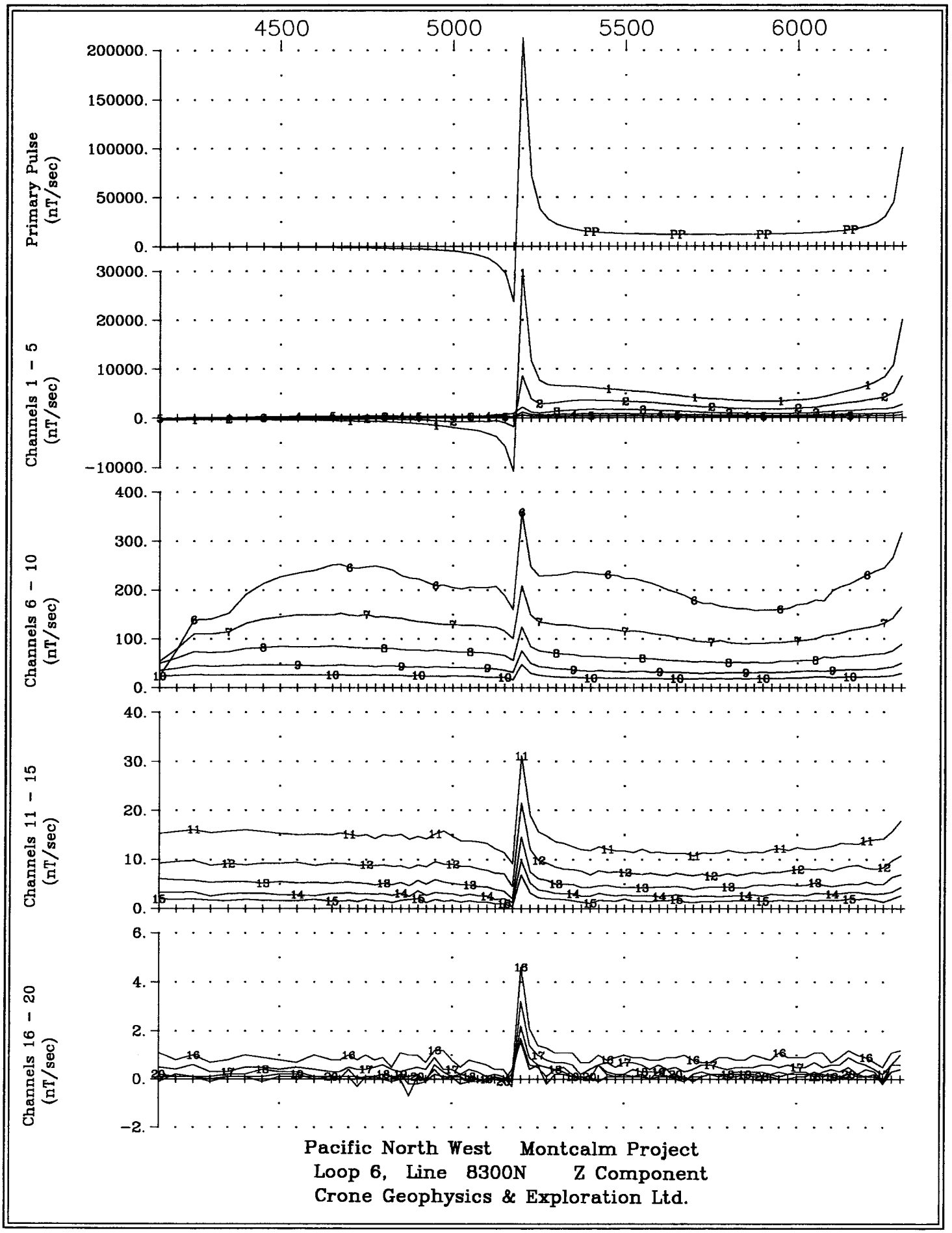
30.
20.
10.
0.
Pacific North West
Loop 5, Line 10200N
Montcalm Project
X Component
Crone Geophysics & Exploration Ltd.



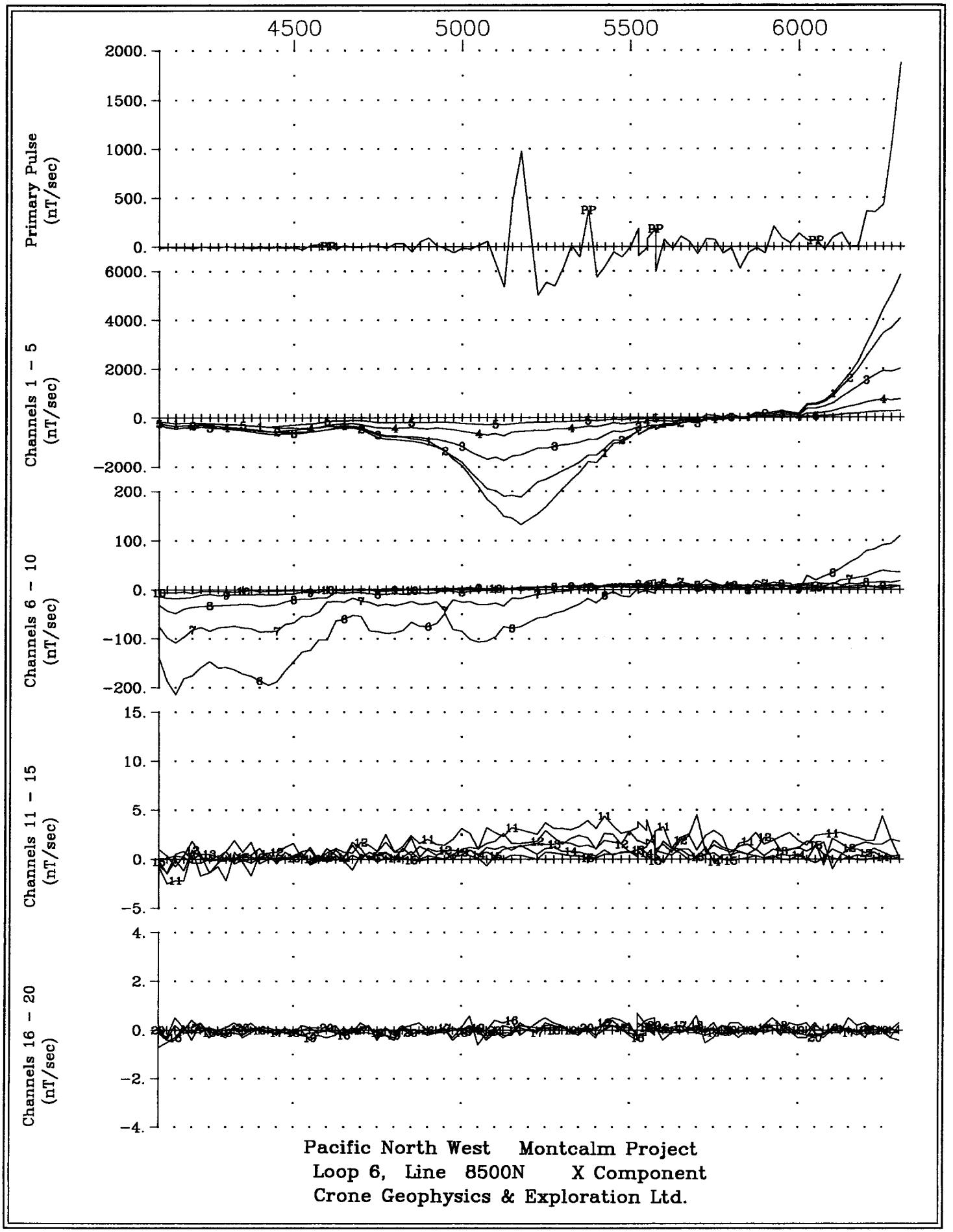
Pacific North West Montcalm Project
Loop 5, Line 10200N Z Component
Crone Geophysics & Exploration Ltd.



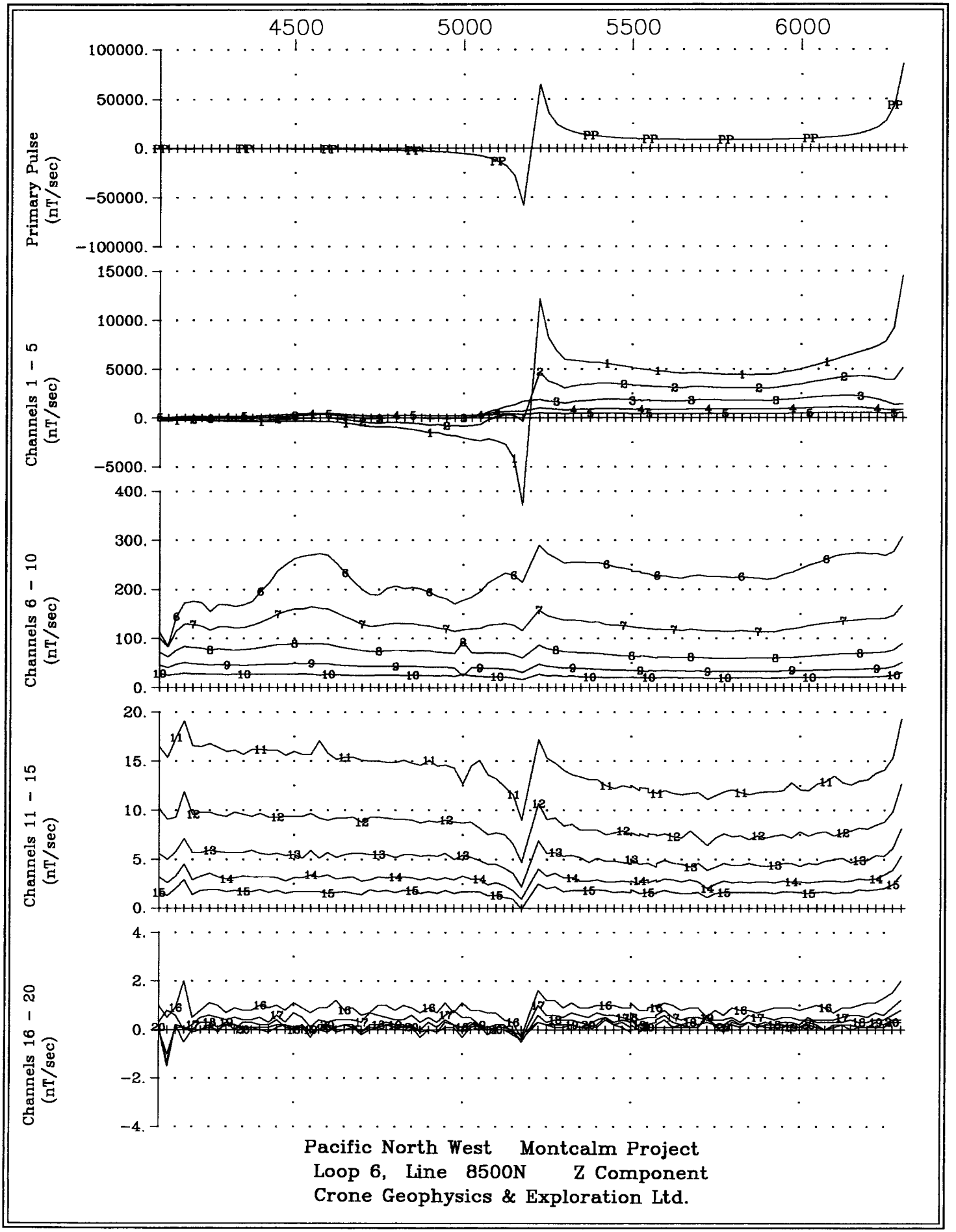
Pacific North West Montcalm Project
Loop 6, Line 8300N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 8300N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 8500N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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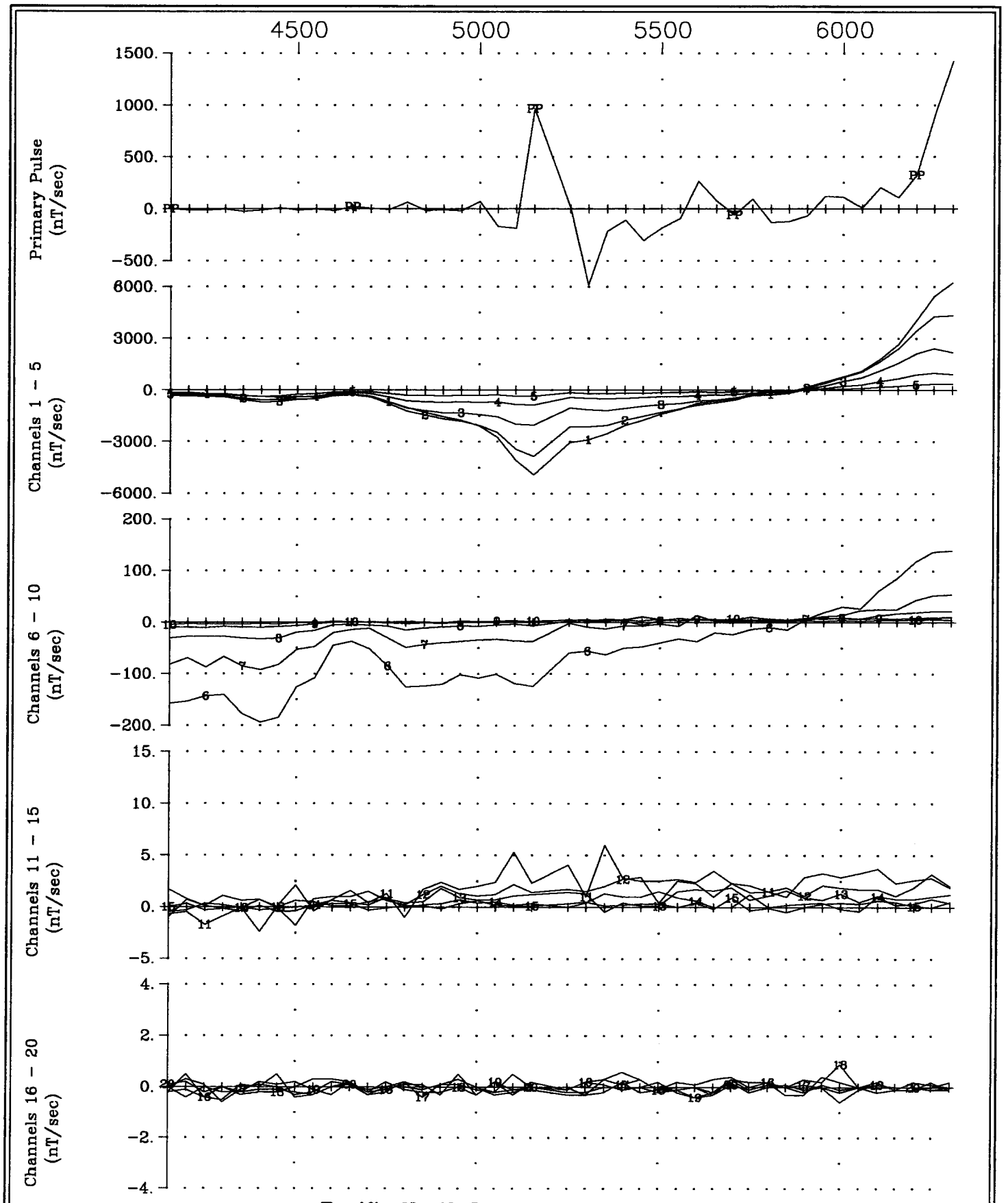
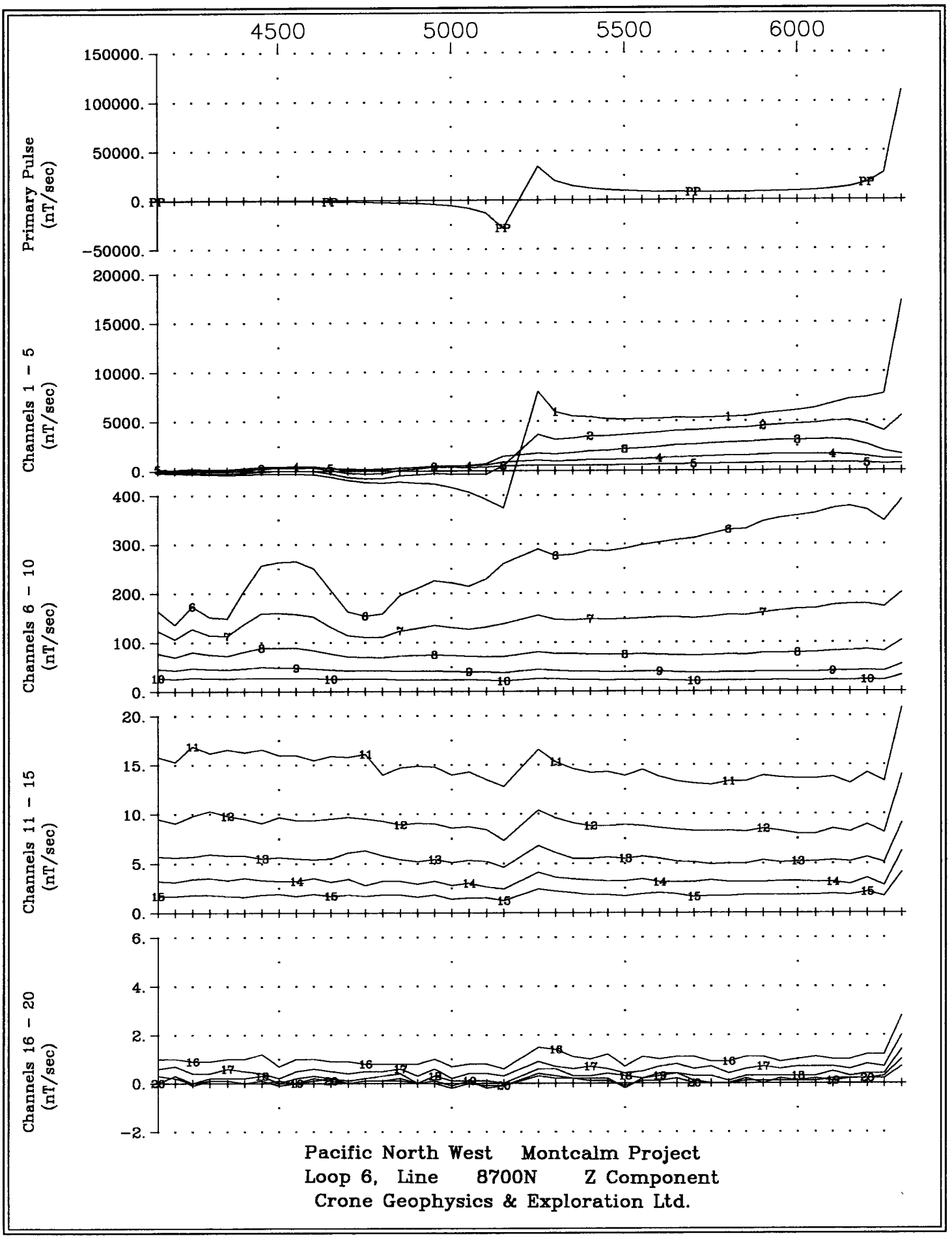
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 8700N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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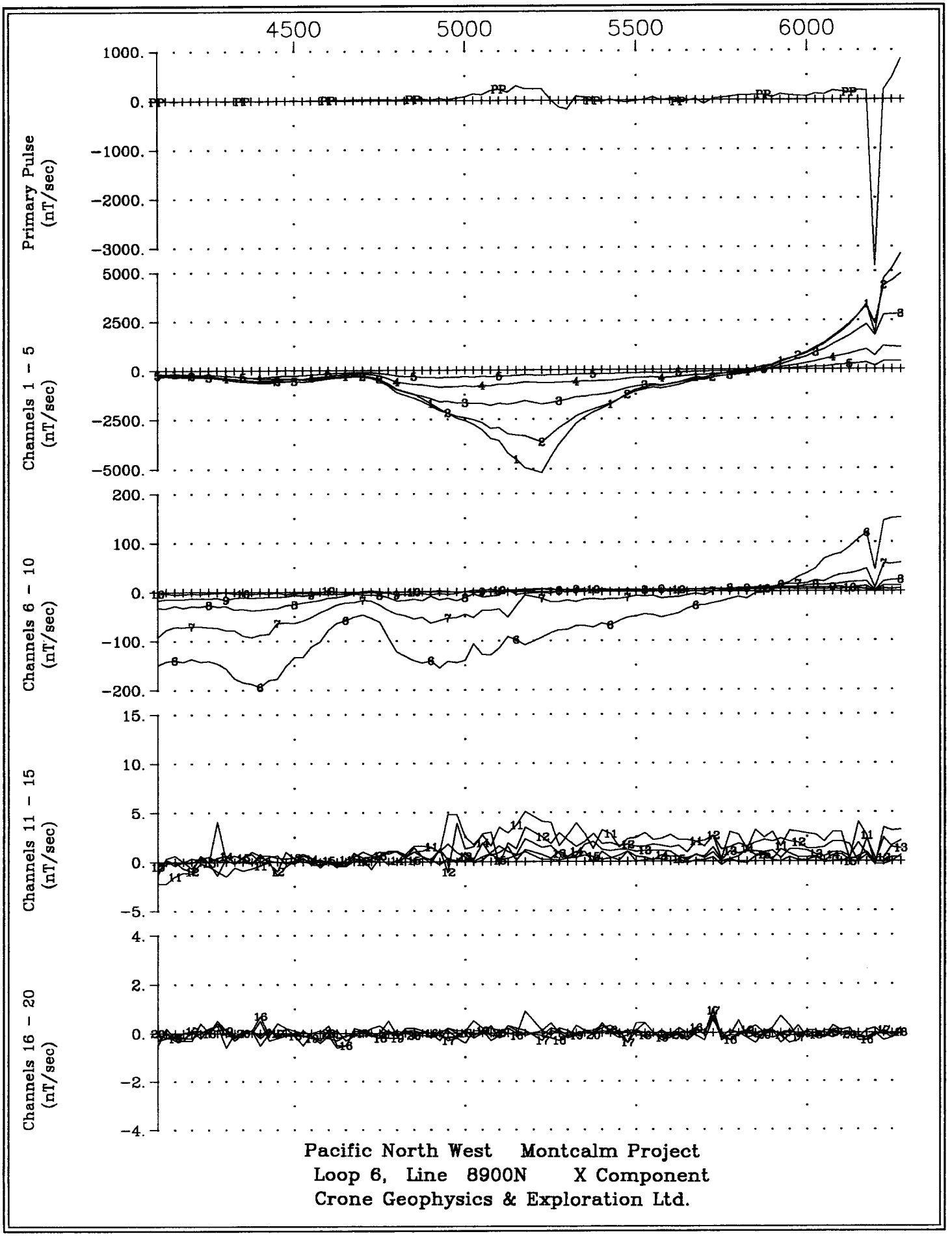
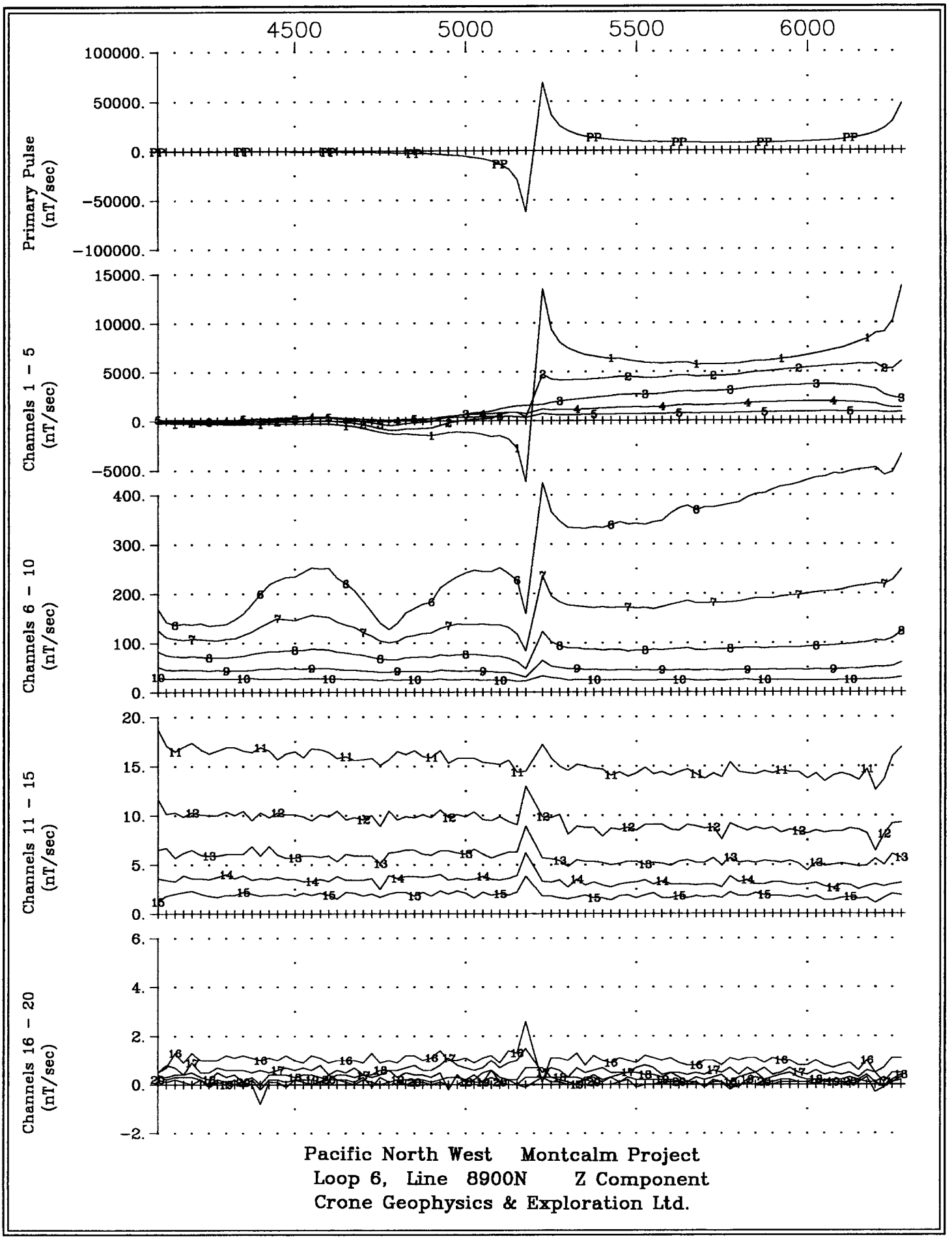
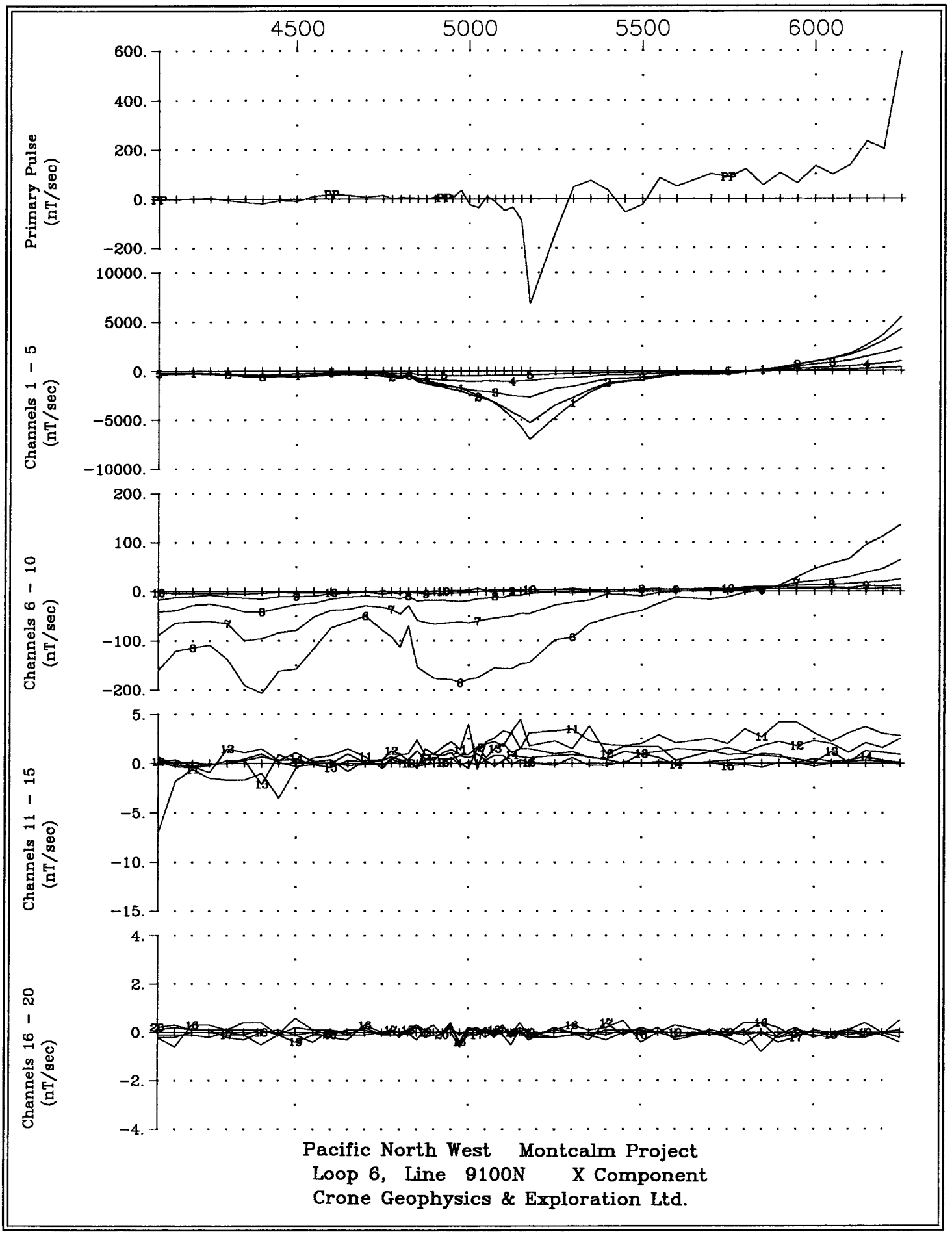


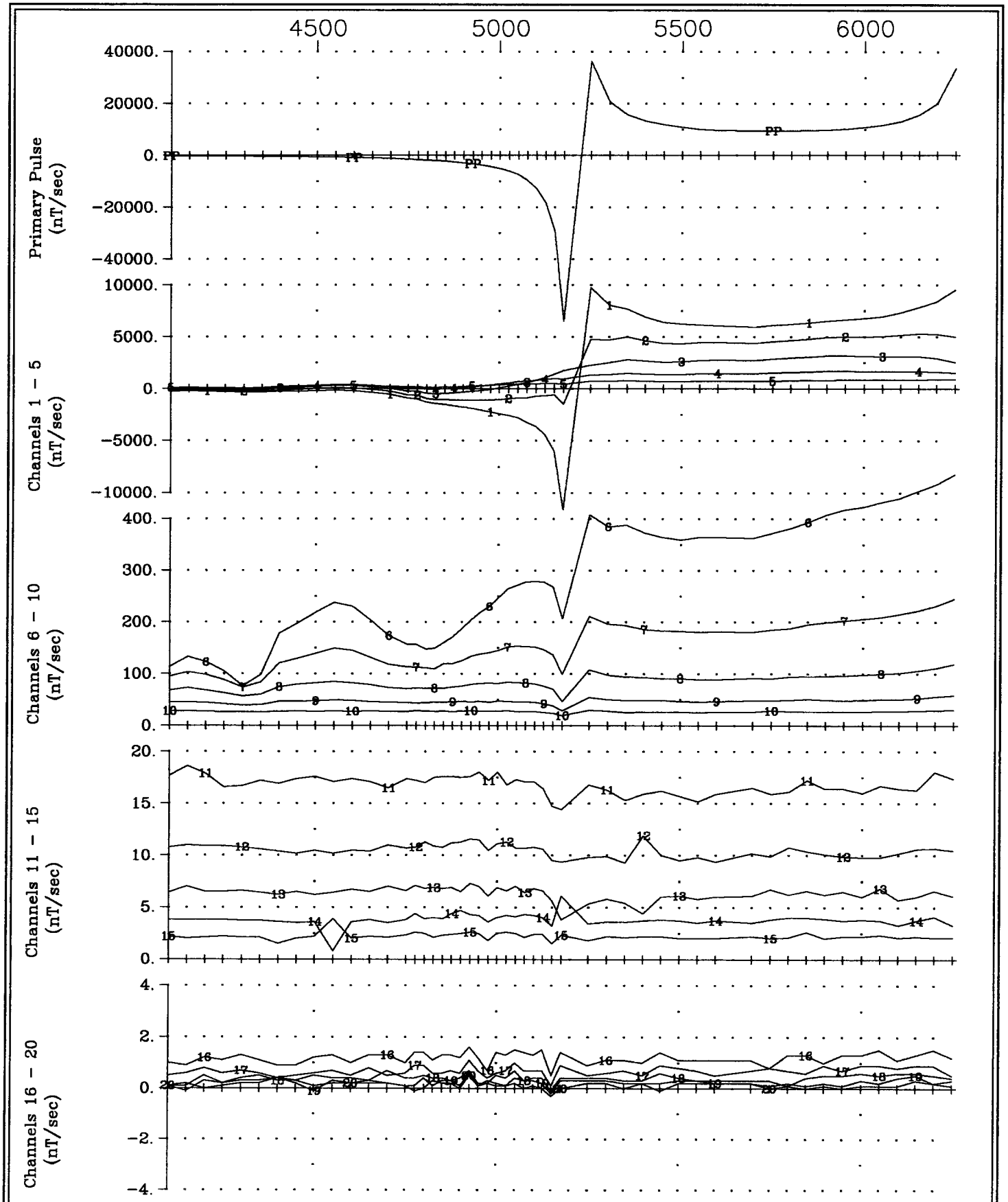
Pacific North West Montcalm Project
Loop 6, Line 8900N X Component
Crone Geophysics & Exploration Ltd.



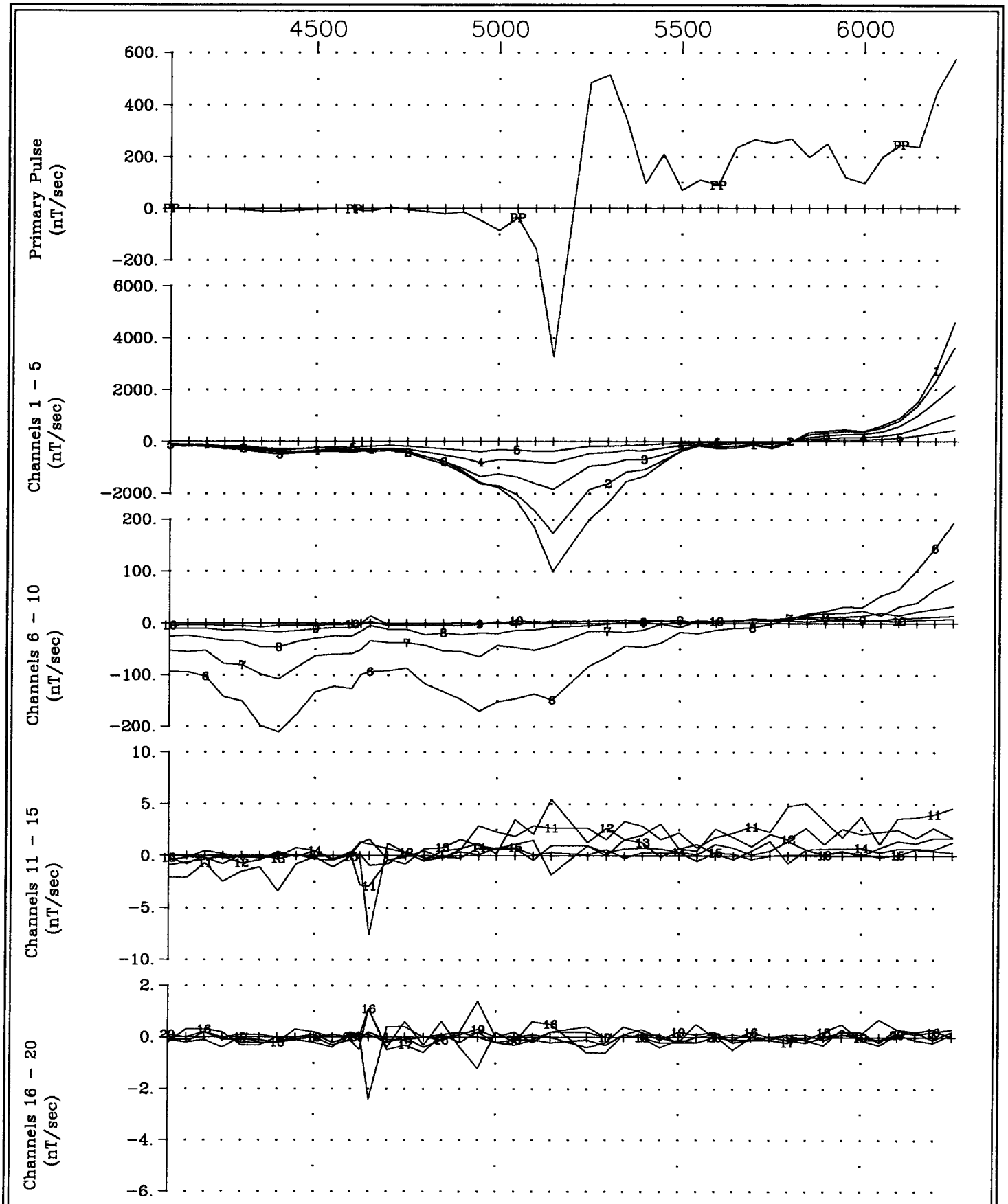
Pacific North West Montcalm Project
Loop 6, Line 8900N Z Component
Crone Geophysics & Exploration Ltd.



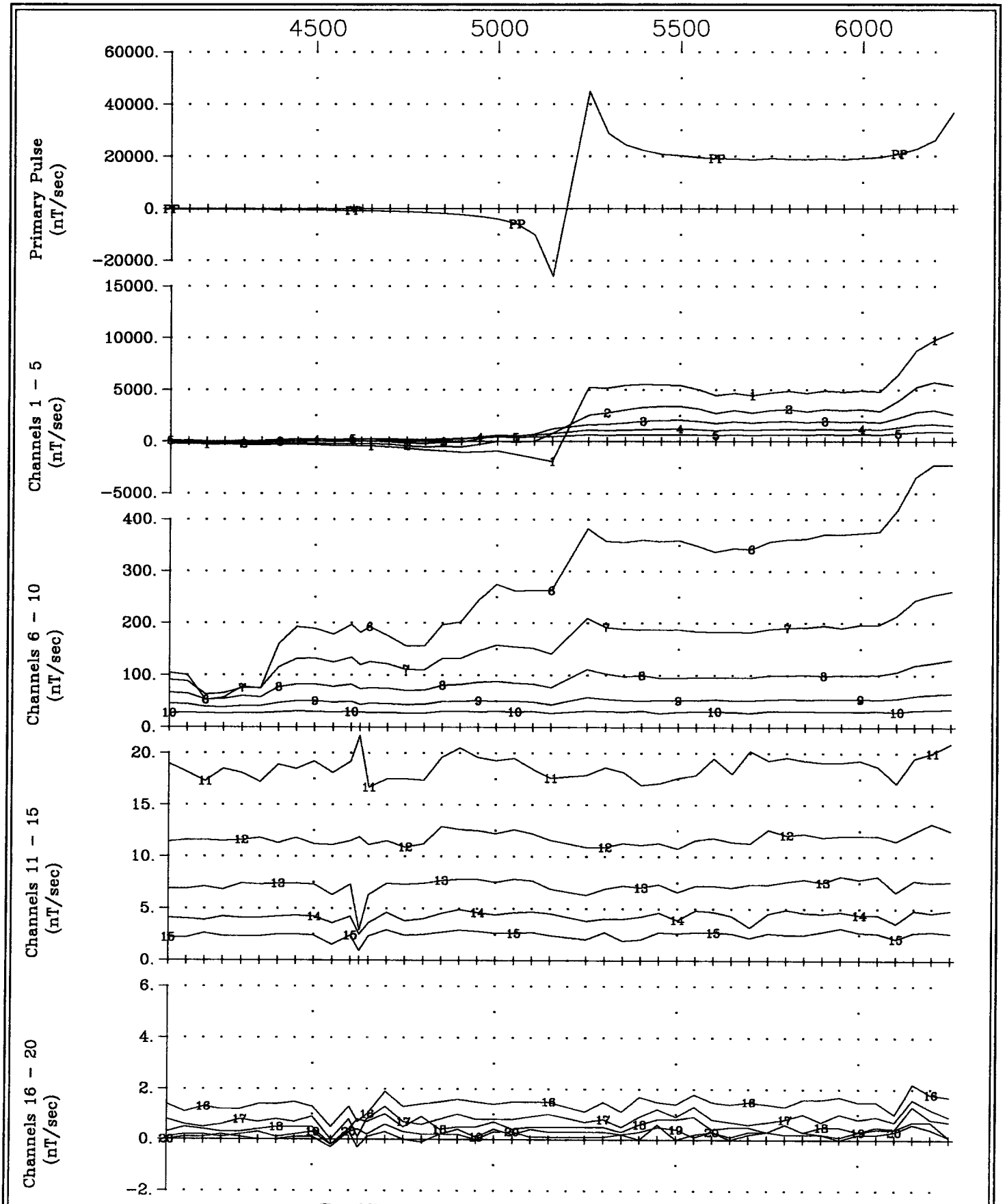
Pacific North West Montcalm Project
Loop 6, Line 9100N X Component
Crone Geophysics & Exploration Ltd.



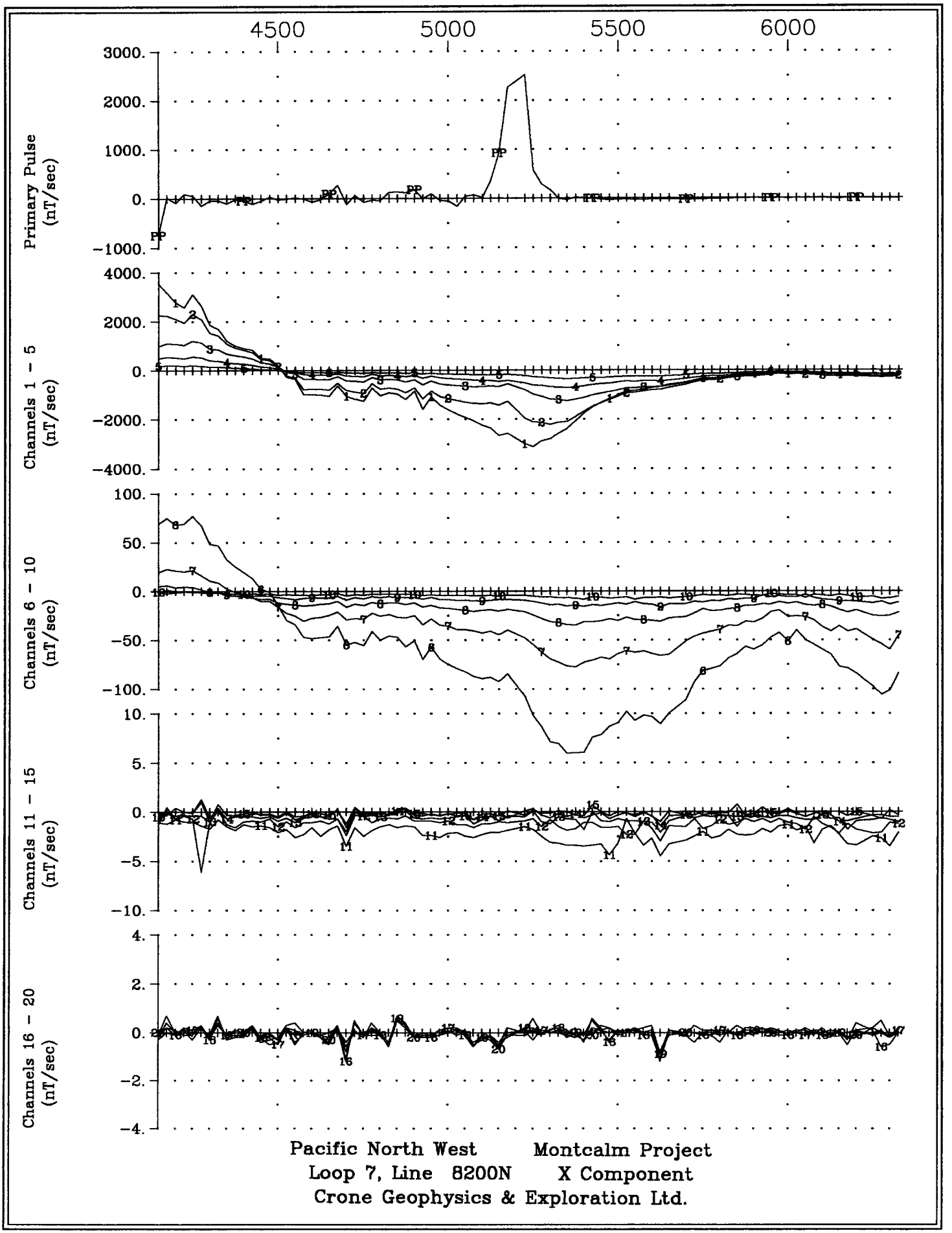
Pacific North West Montcalm Project
Loop 6, Line 9100N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 9300N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 9300N Z Component
Crone Geophysics & Exploration Ltd.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5000
5500
6000
Primary Pulse (nT/sec)
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2000.
1000.
0.
-1000.
Channels 1 - 5 (nT/sec)
4000.
2000.
0.
-2000.
-4000.
Channels 6 - 10 (nT/sec)
100.
50.
0.
-50.
-100.
Channels 11 - 15 (nT/sec)
10.
5.
0.
-5.
-10.
Channels 16 - 20 (nT/sec)
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2.
0.
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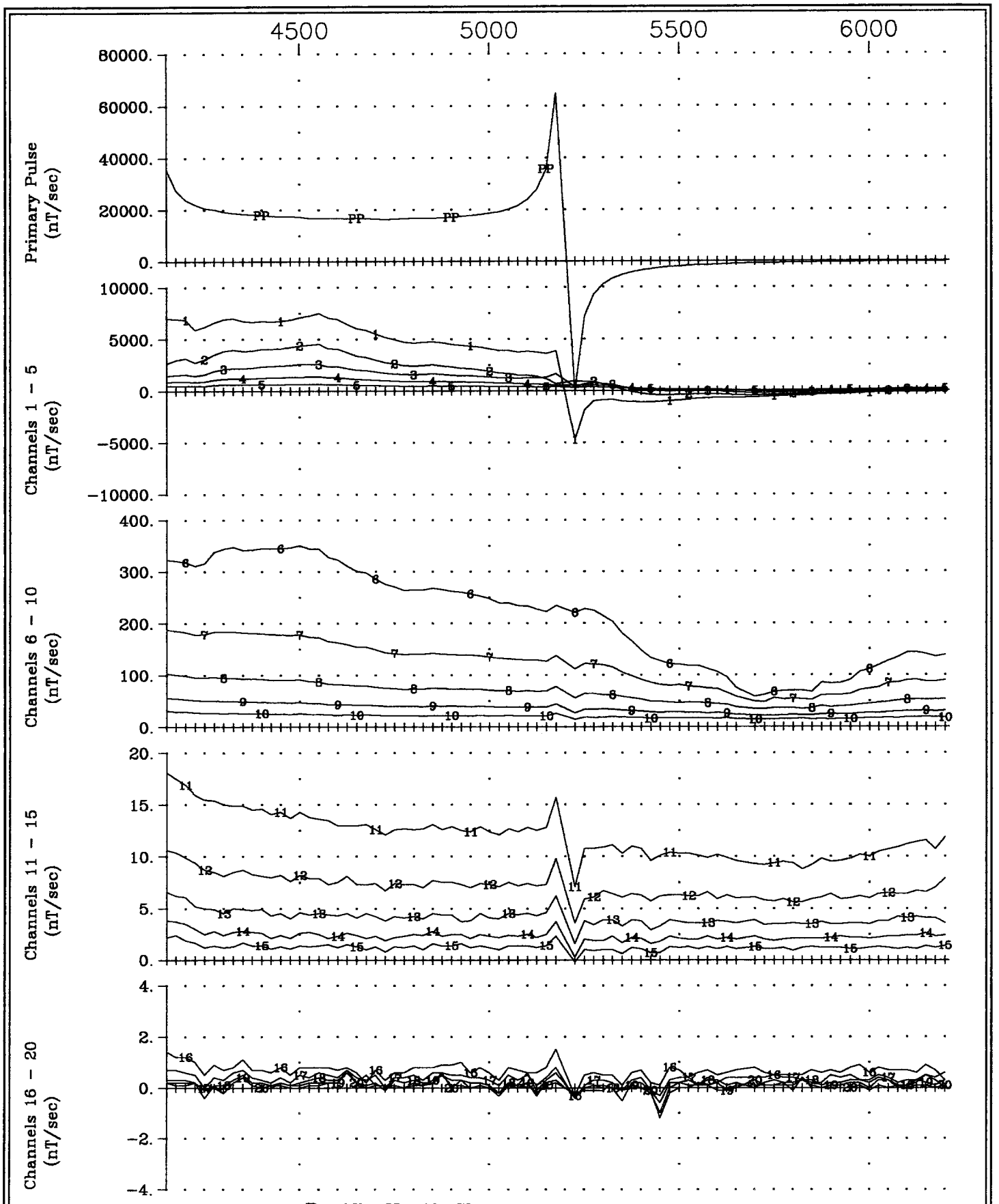
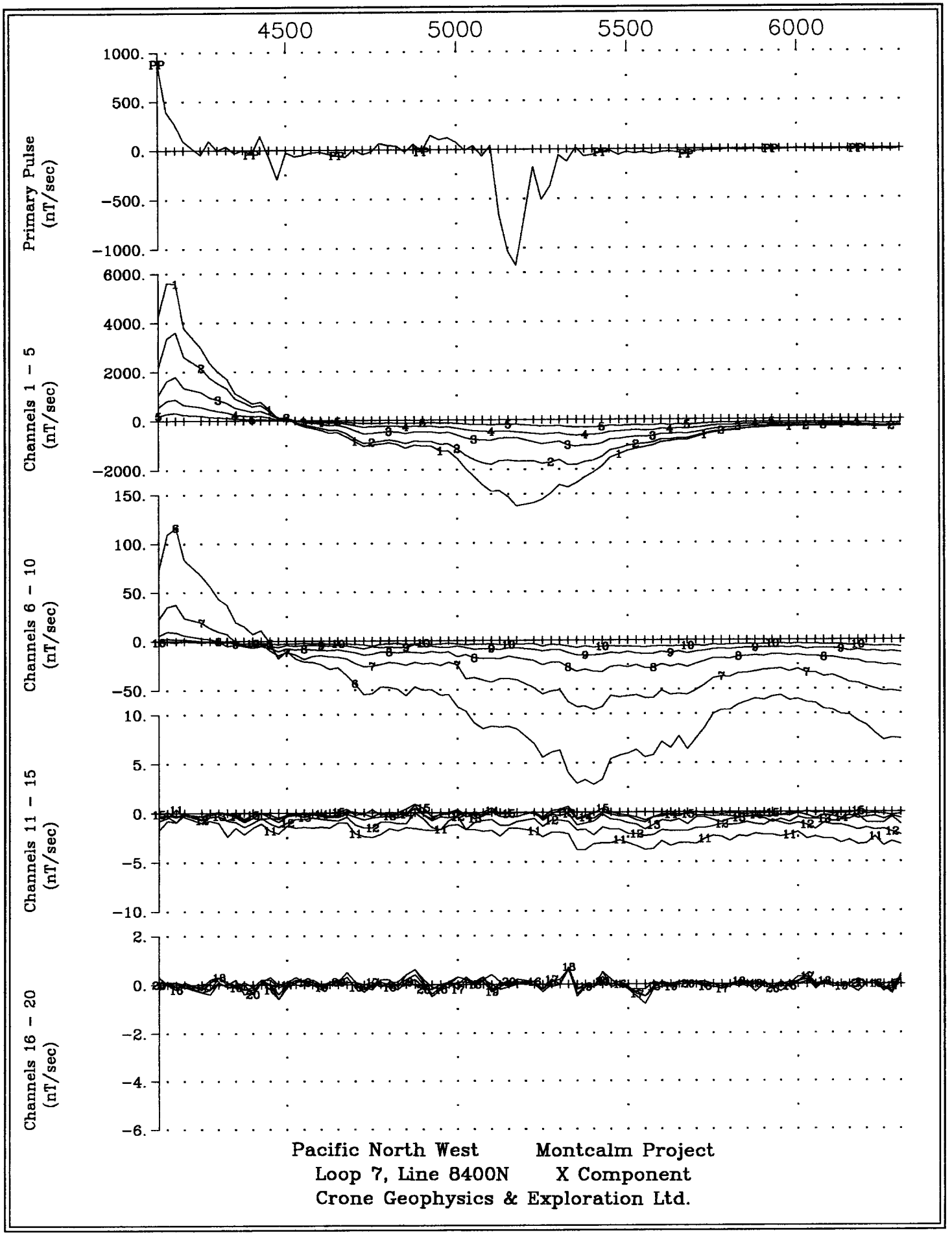
-4.
Pacific North West Montcalm Project
Loop 7, Line 8200N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 7, Line 8200N Z Component
Crone Geophysics & Exploration Ltd.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5000
5500
6000
Primary Pulse (nT/sec)
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500.
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-500.
-1000.
Channels 1 - 5 (nT/sec)
6000.
4000.
2000.
0.
-2000.
Channels 6 - 10 (nT/sec)
150.
100.
50.
0.
-50.
Channels 11 - 15 (nT/sec)
10.
5.
0.
-5.
-10.
Channels 16 - 20 (nT/sec)
2.
0.
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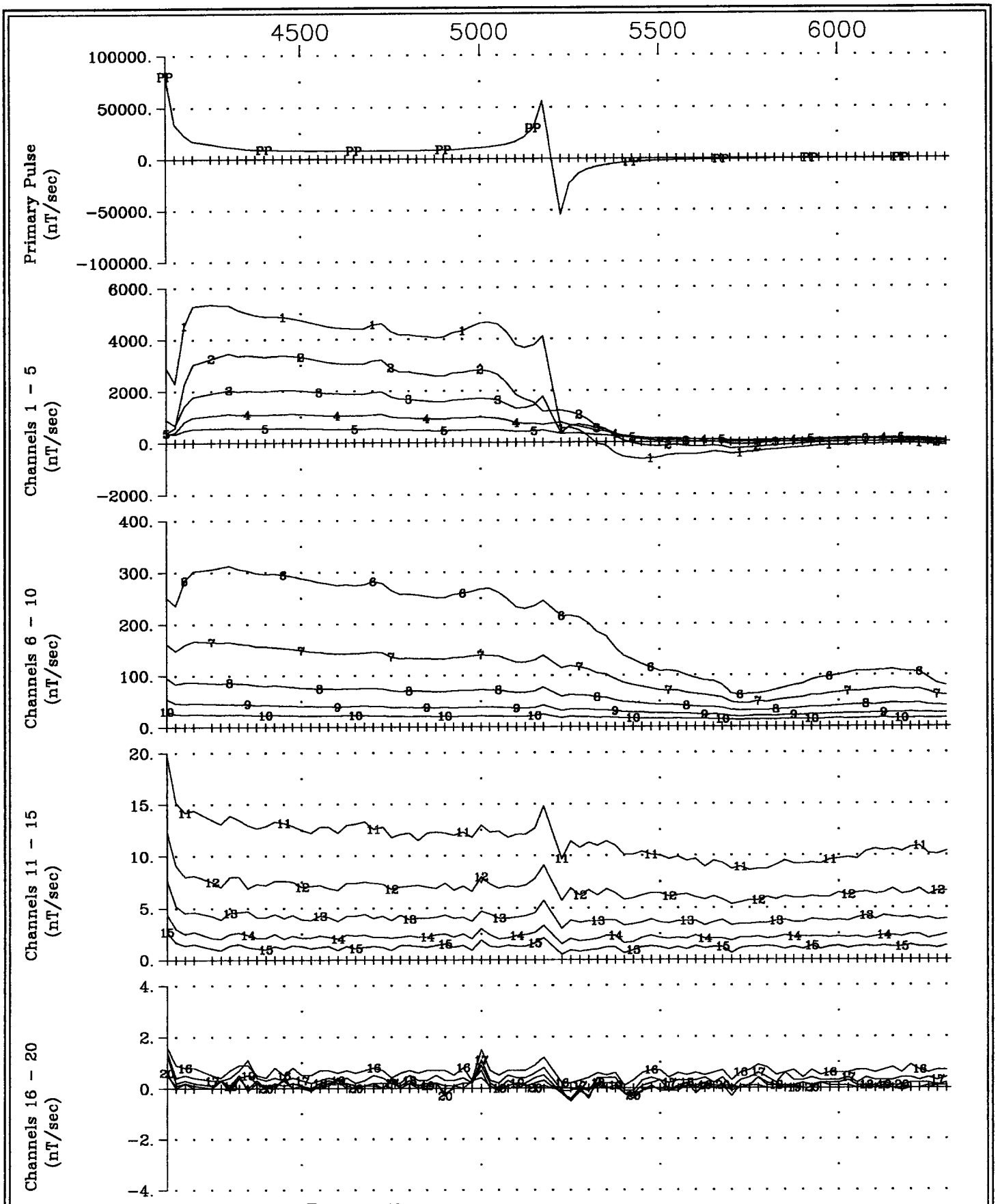
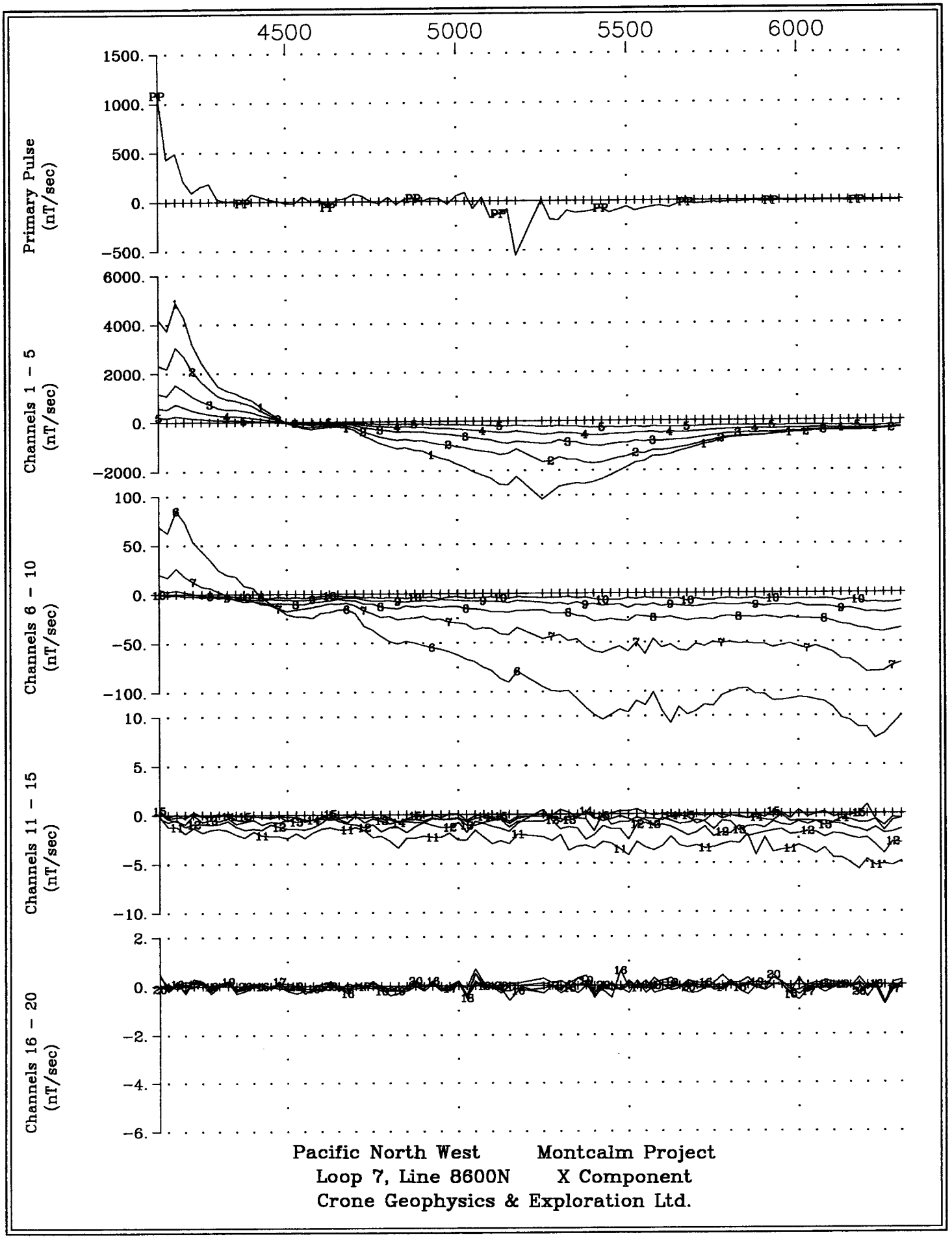
-4.
-6.
Pacific North West
Montcalm Project
Loop 7, Line 8400N
X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 7, Line 8400N Z Component
Crone Geophysics & Exploration Ltd.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5000
5500
6000
Primary Pulse (nT/sec)
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1000.
500.
0.
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Channels 1 - 5 (nT/sec)
6000.
4000.
2000.
0.
-2000.
Channels 6 - 10 (nT/sec)
100.
50.
0.
-50.
-100.
Channels 11 - 15 (nT/sec)
10.
5.
0.
-5.
-10.
Channels 16 - 20 (nT/sec)
2.
0.
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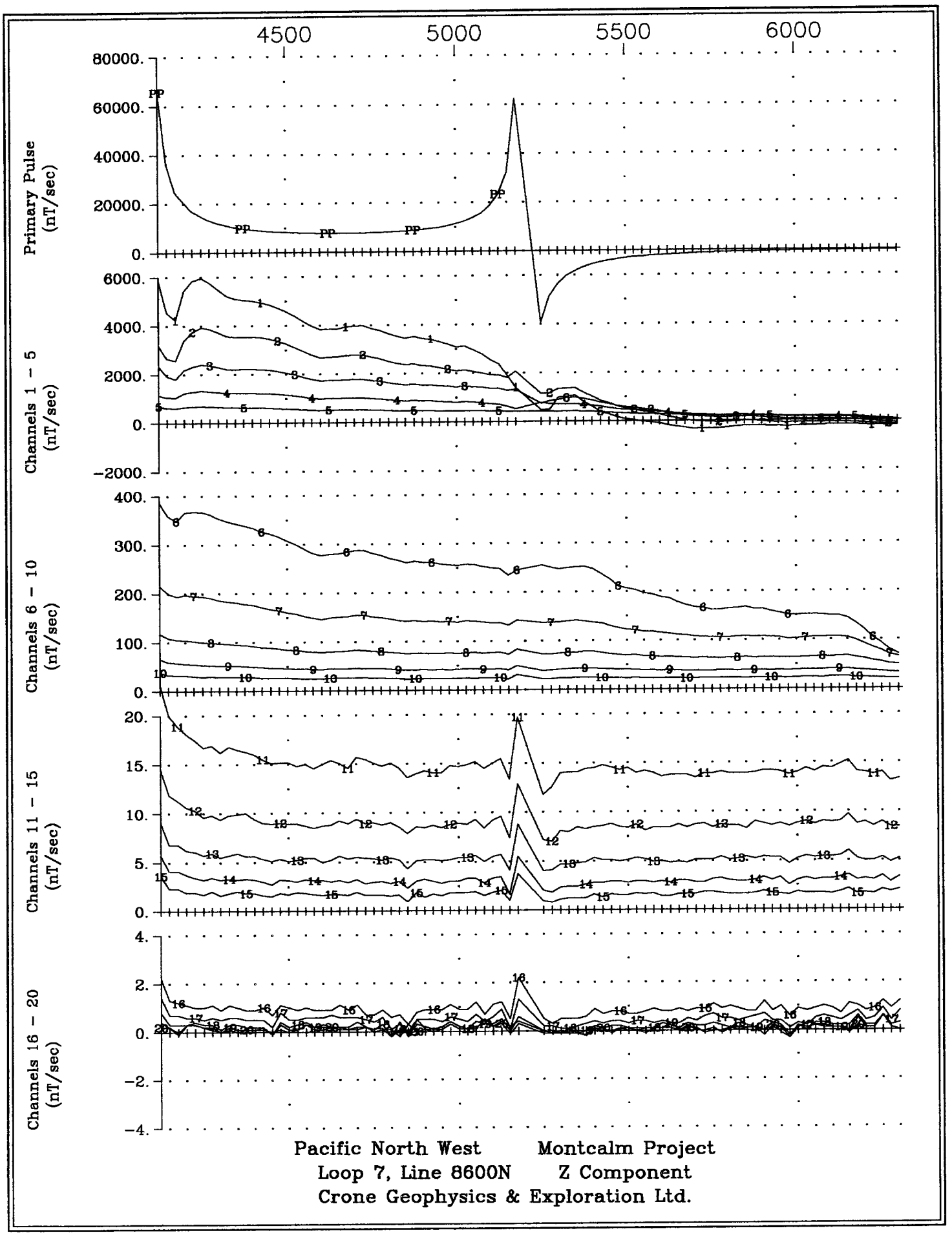
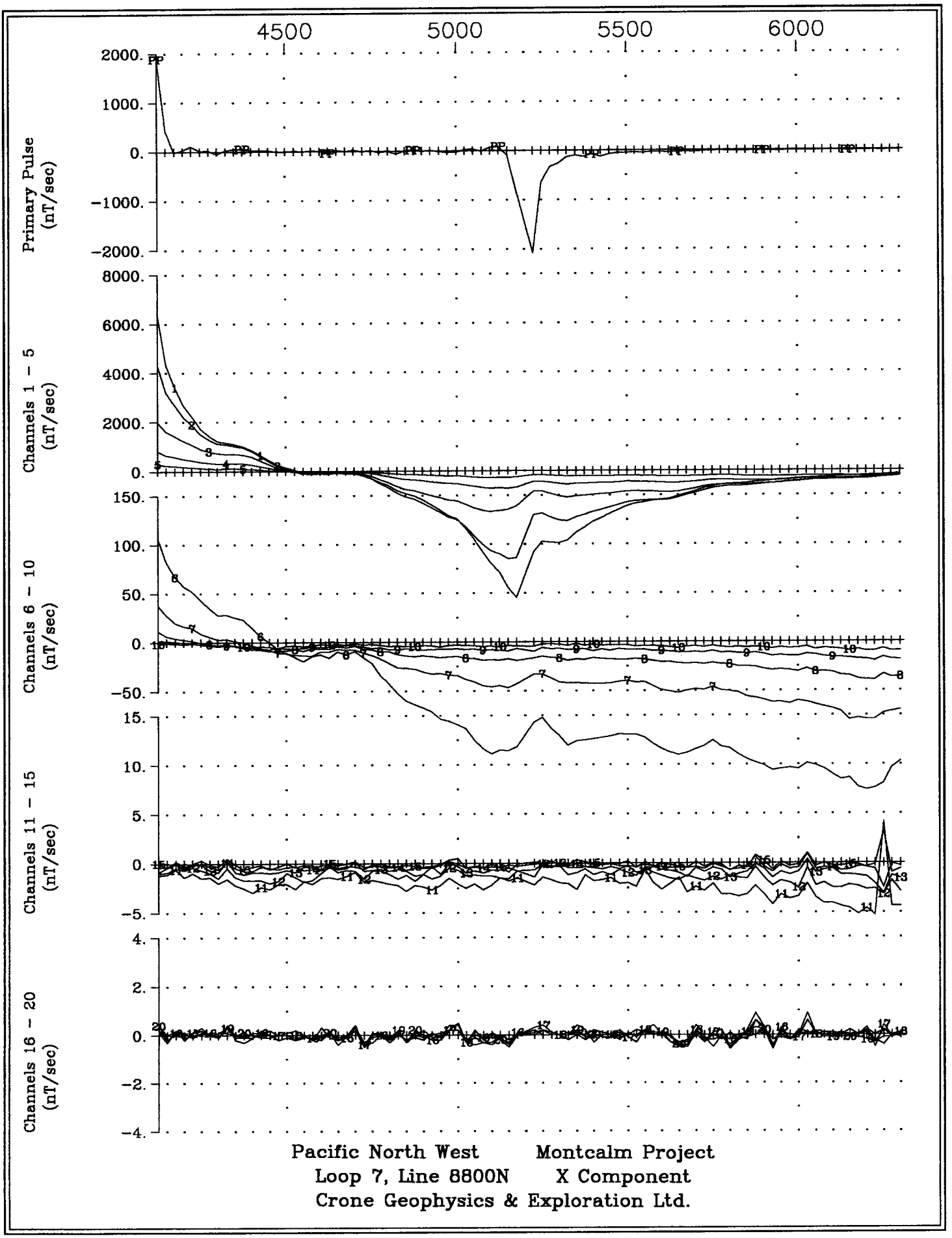
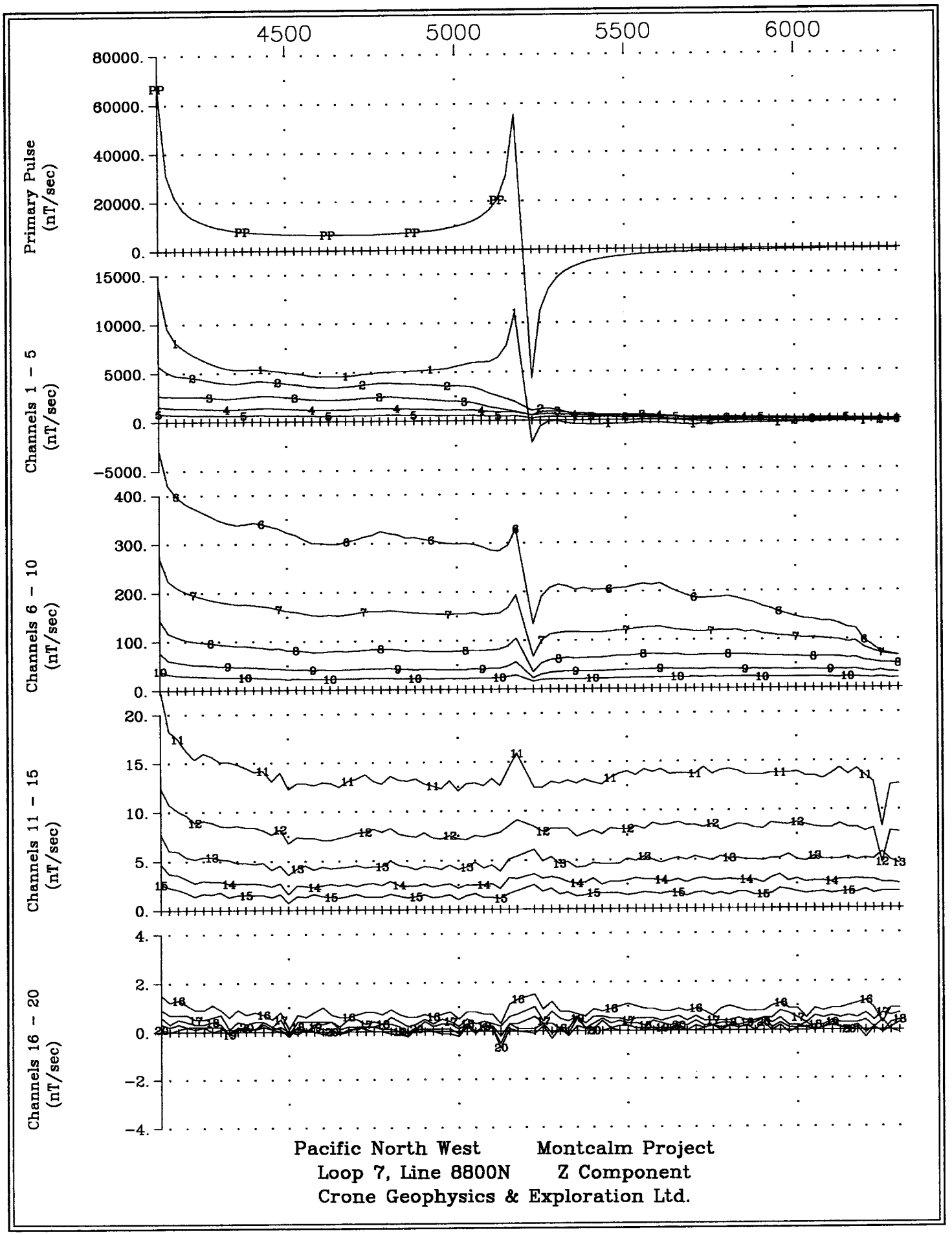
-4.
-6.
Pacific North West Montcalm Project
Loop 7, Line 8600N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 7, Line 8600N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 7, Line 8800N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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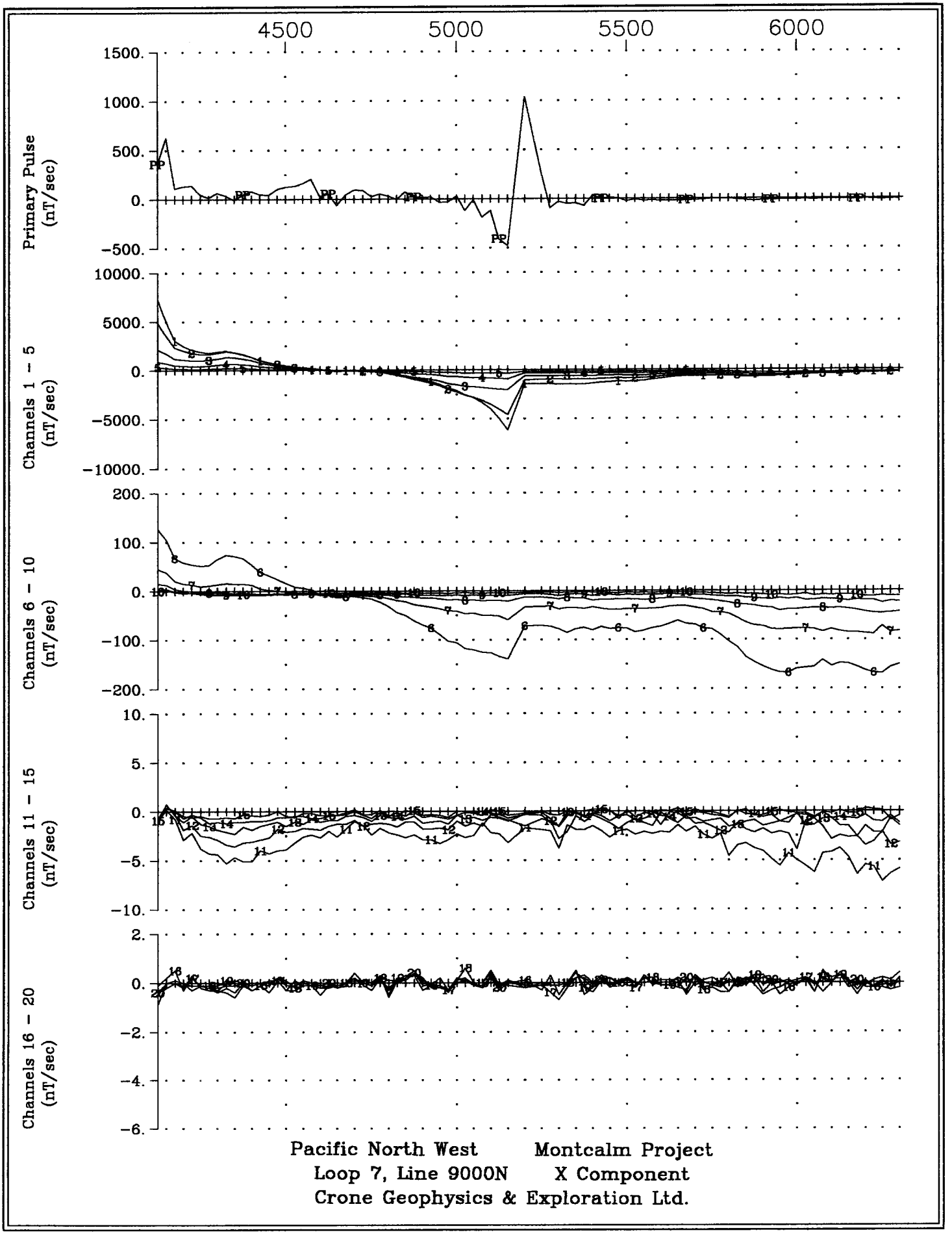
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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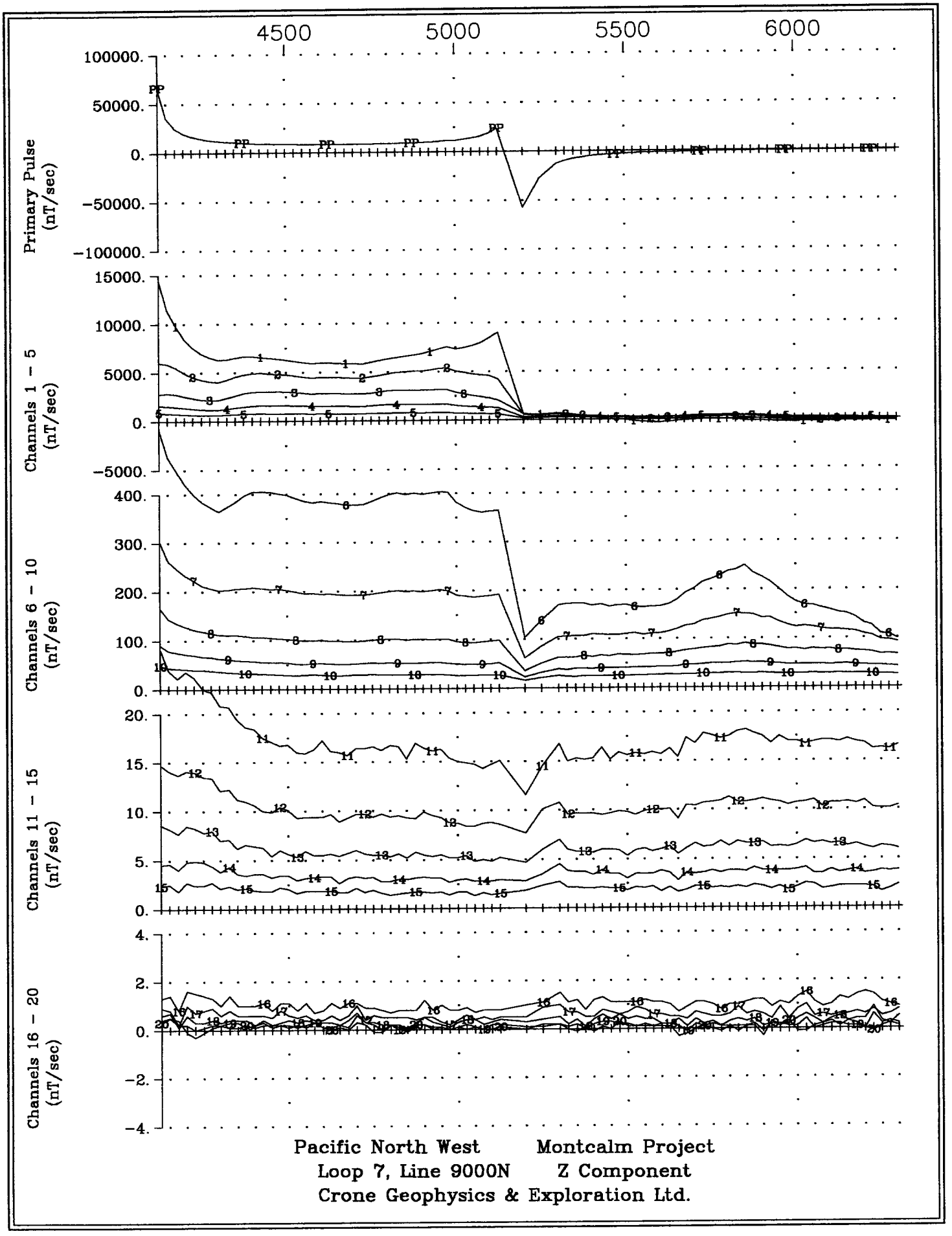
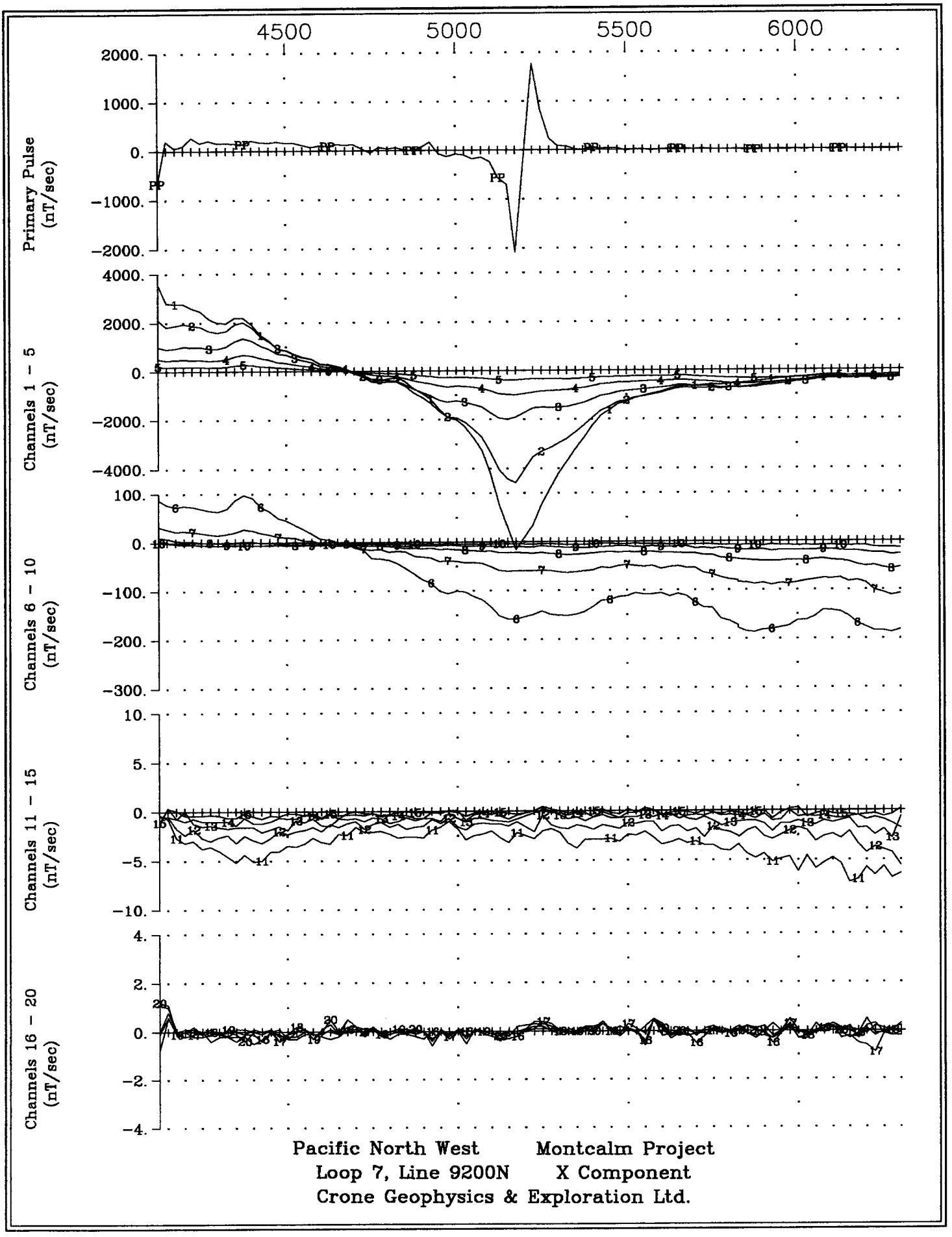
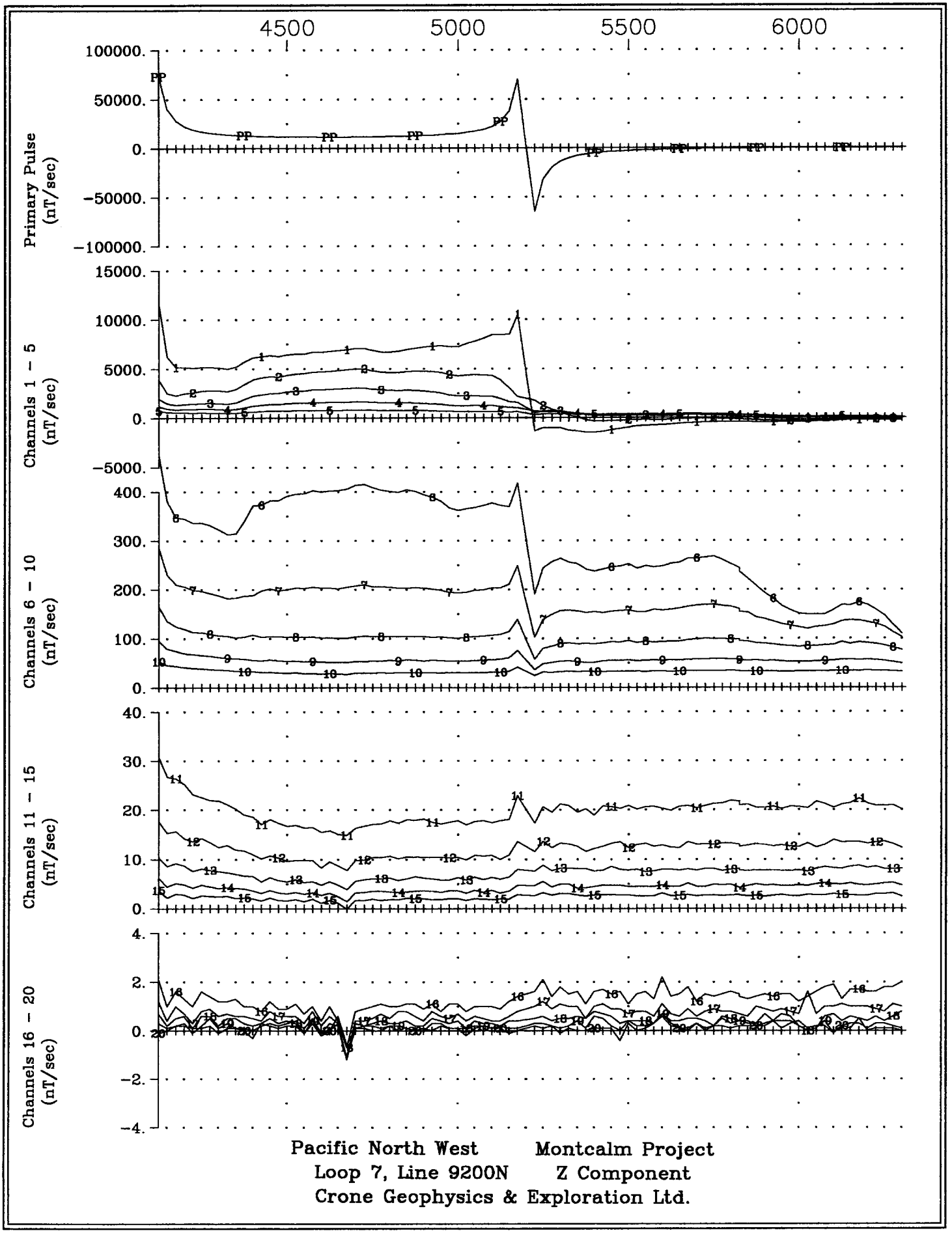
Crone Geophysics & Exploration Ltd.



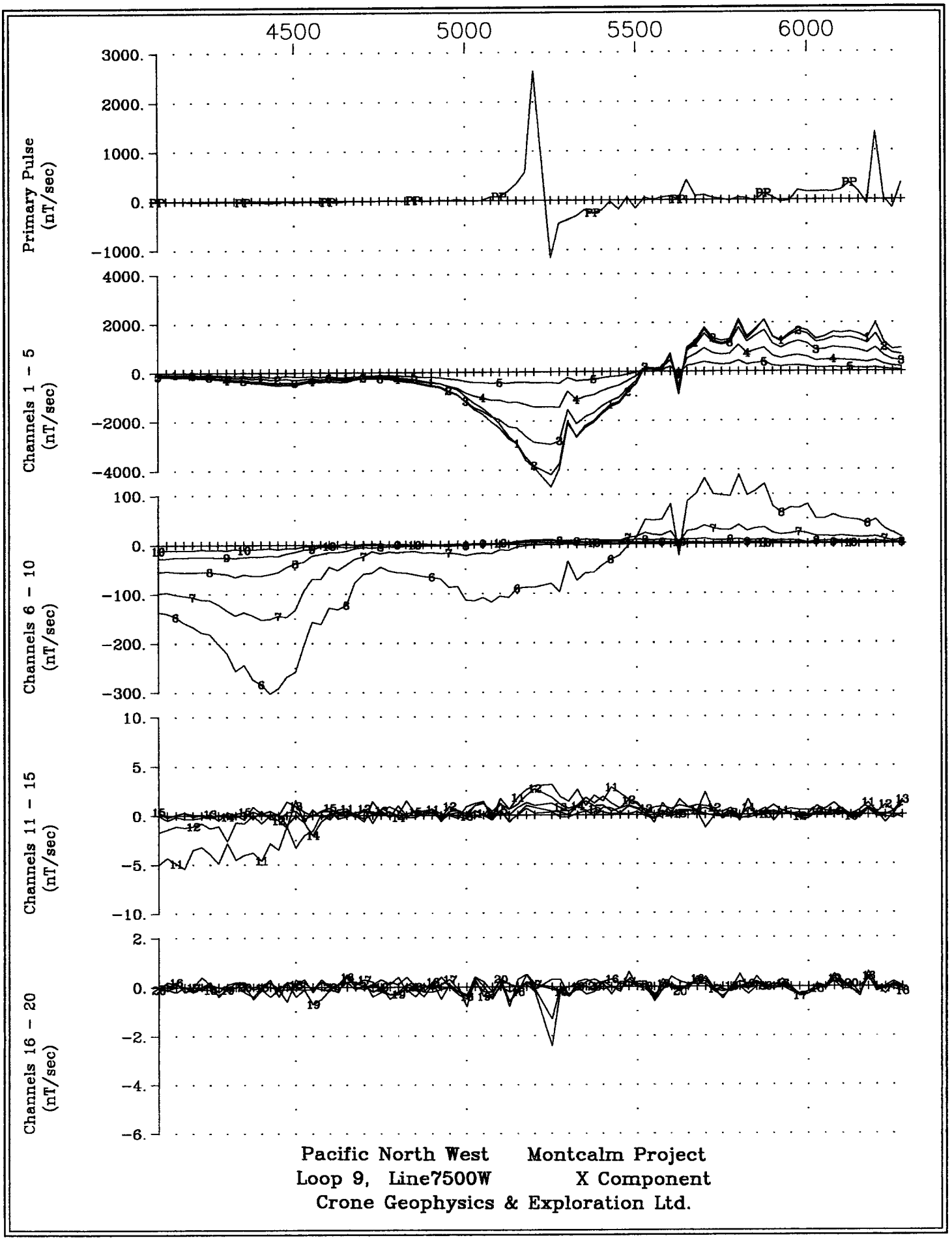
Pacific North West Montcalm Project
Loop 7, Line 9000N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 7, Line 9200N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 7, Line 9200N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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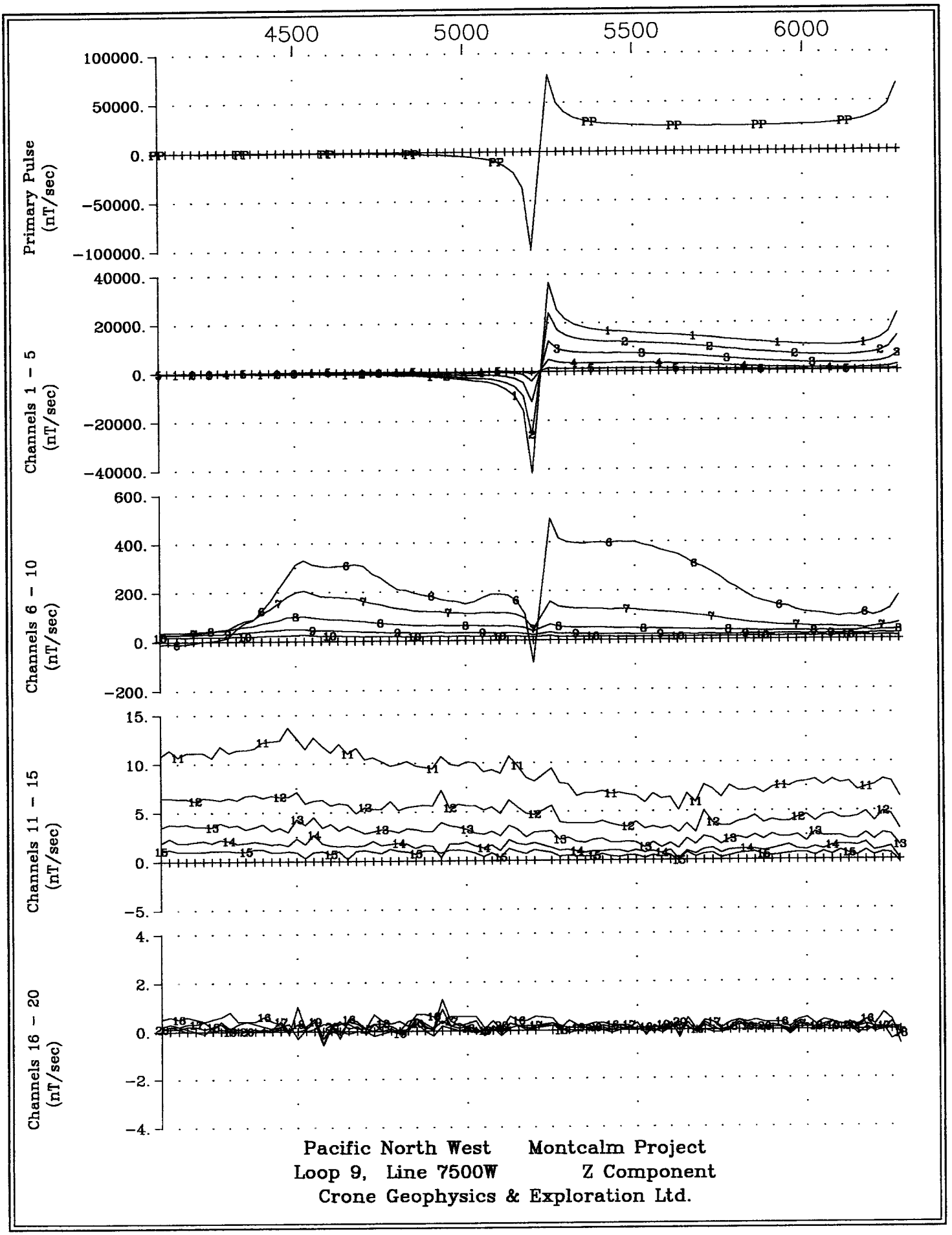

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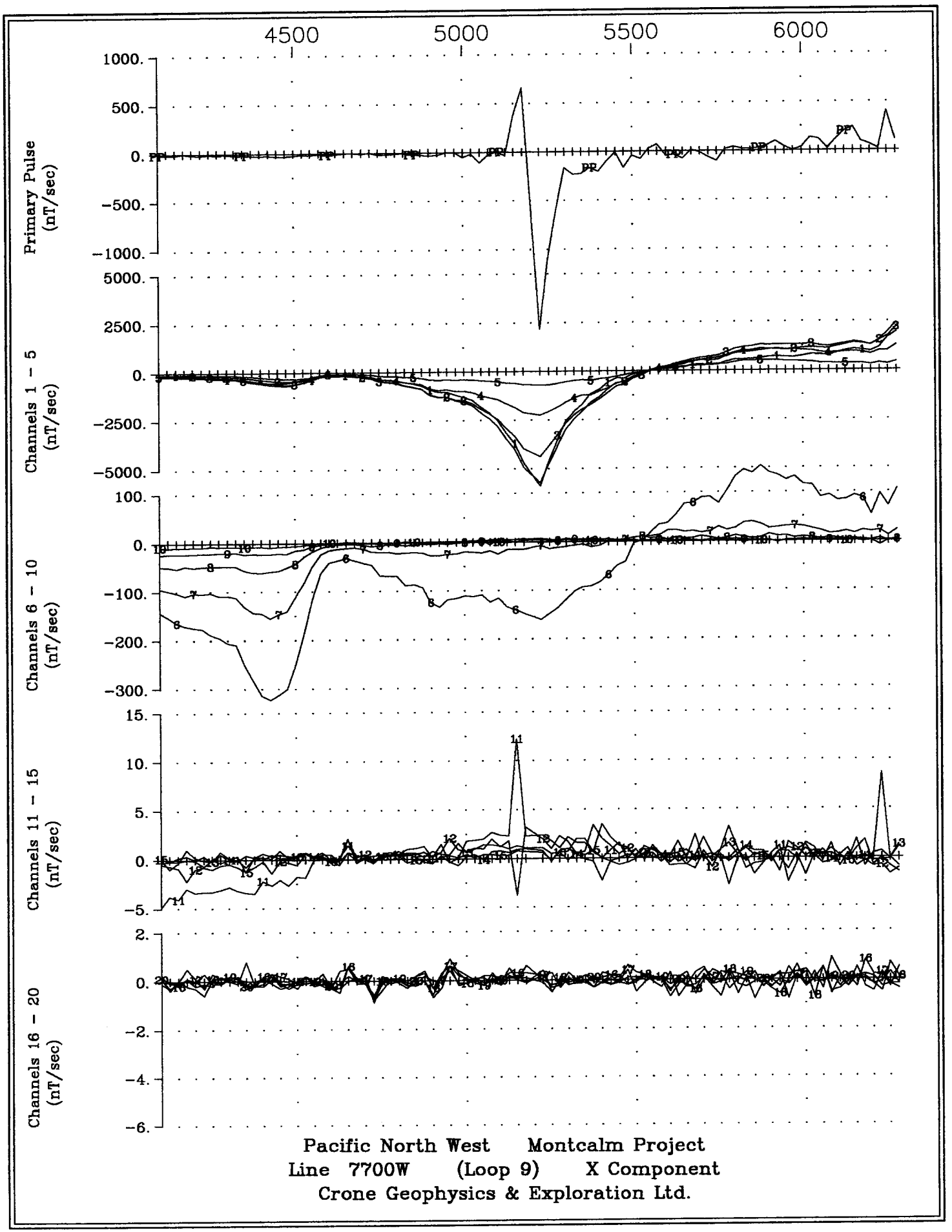

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Line 7700W (Loop 9) X Component
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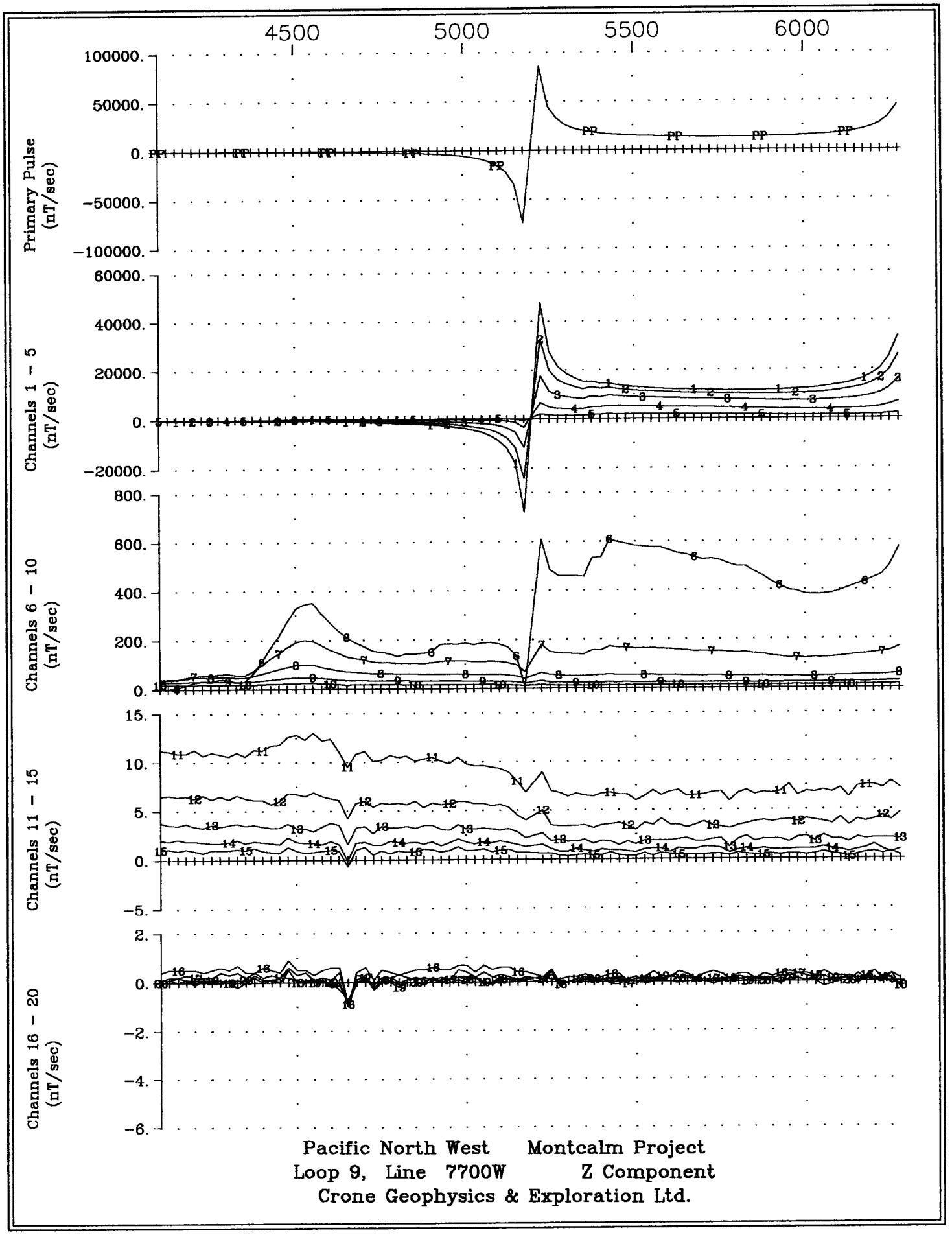

Pacific North West Montcalm Project
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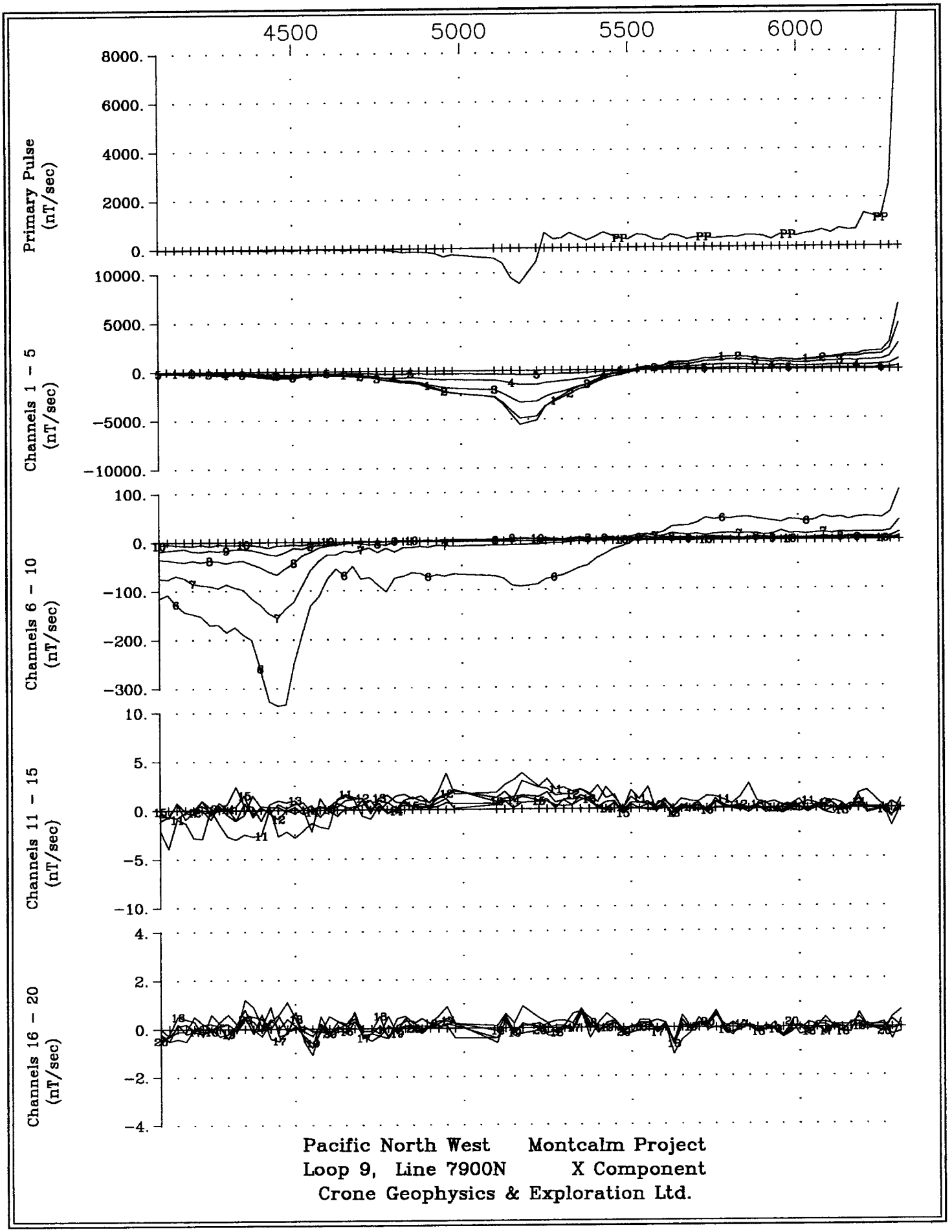

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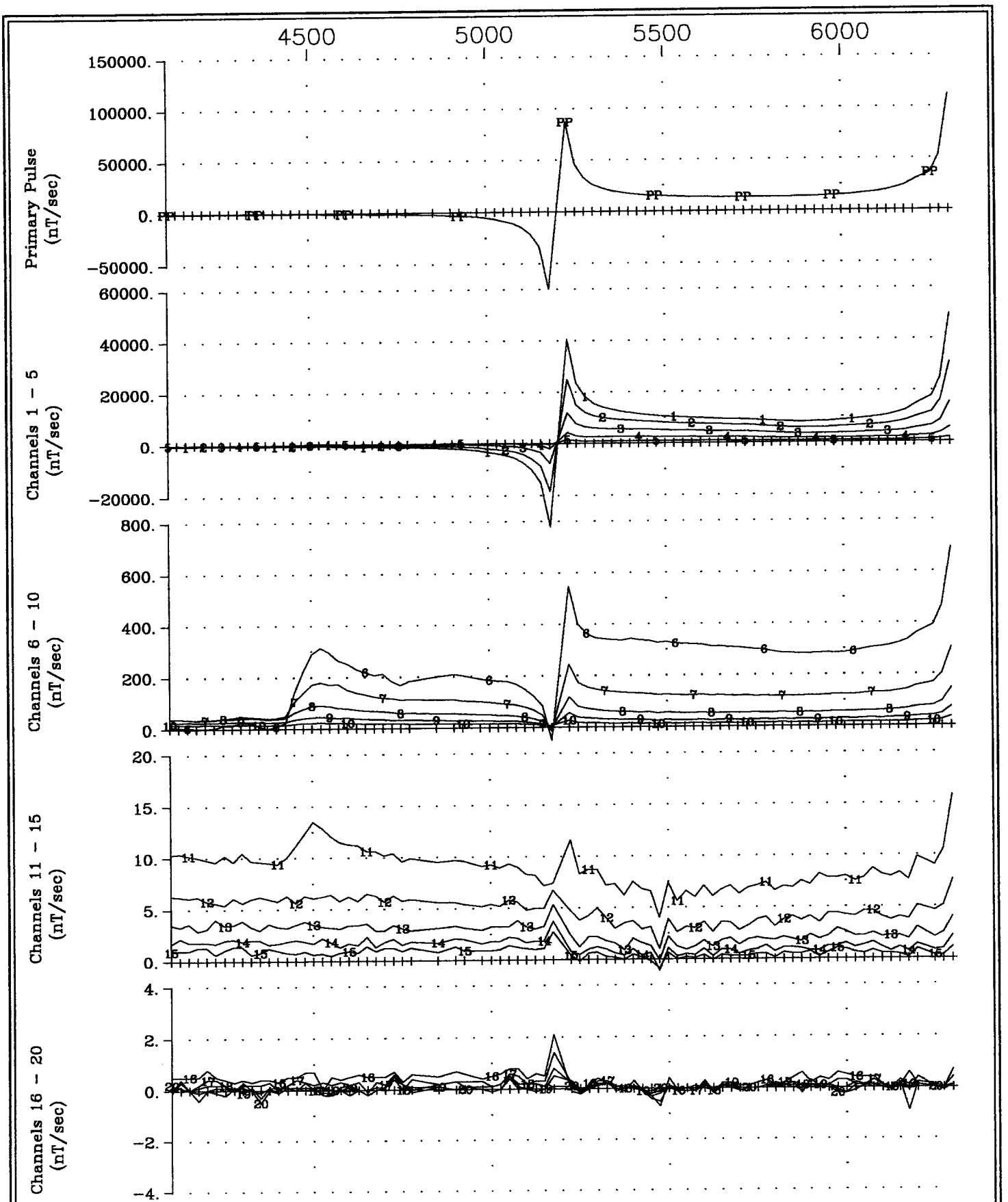
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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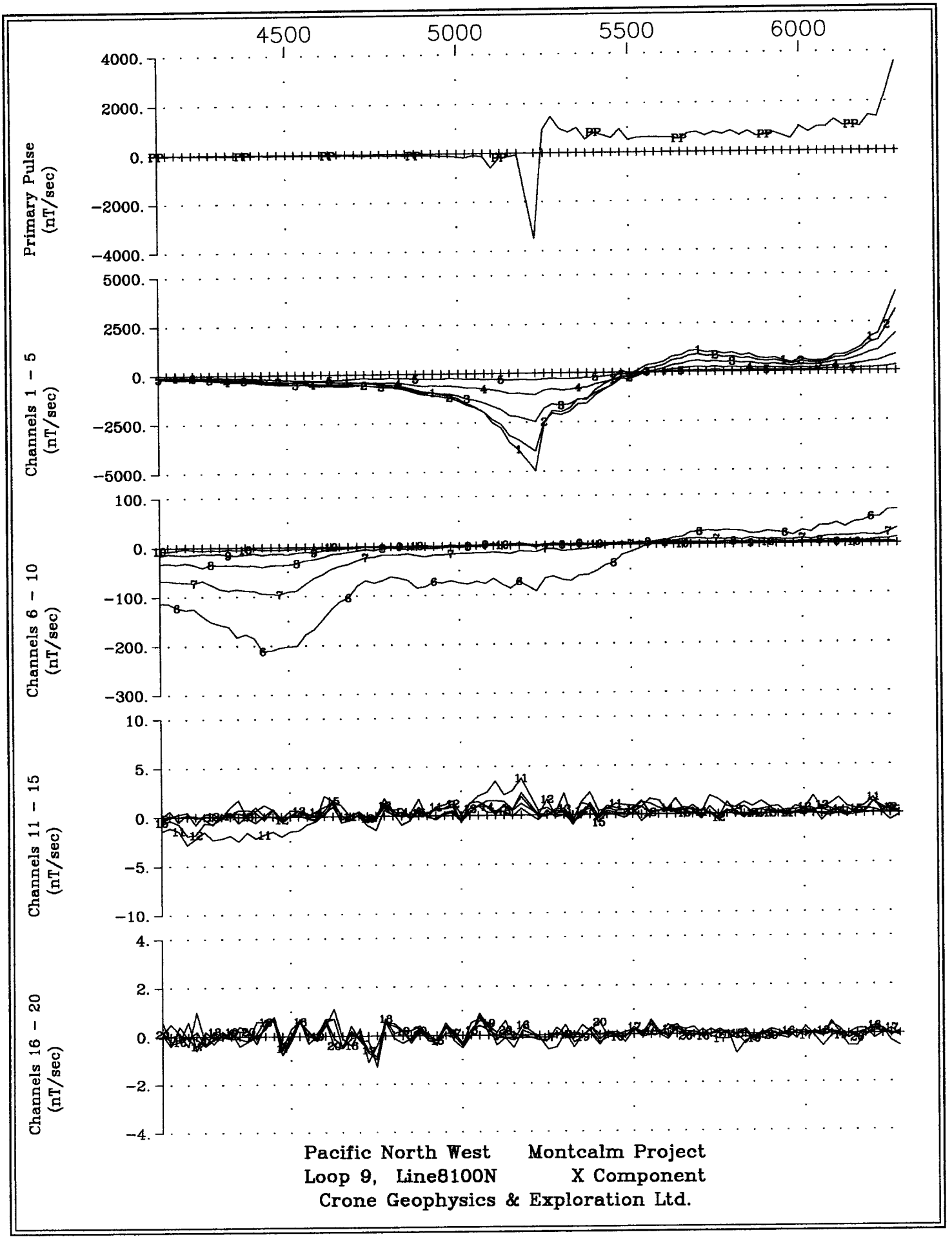
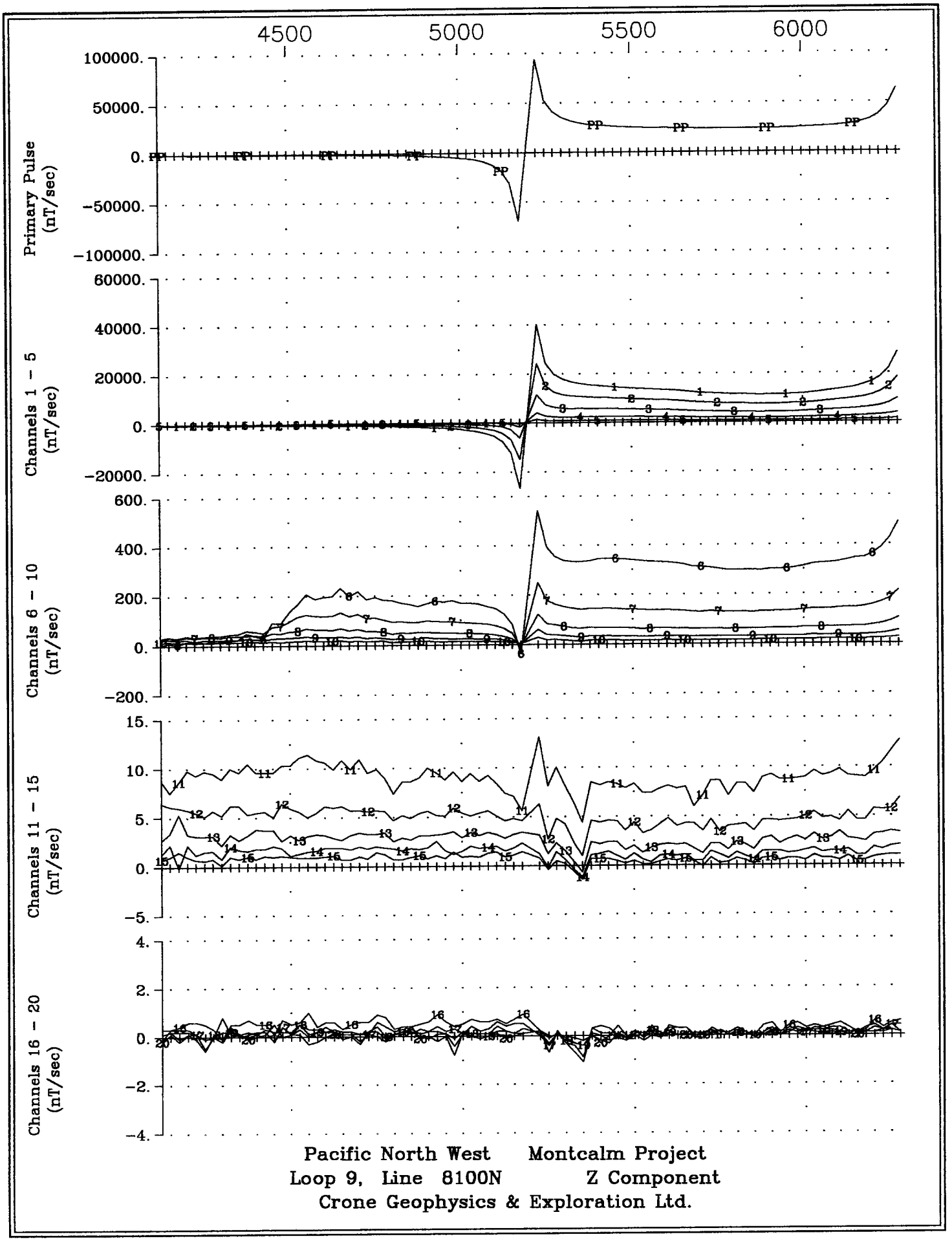
Crone Geophysics & Exploration Ltd.



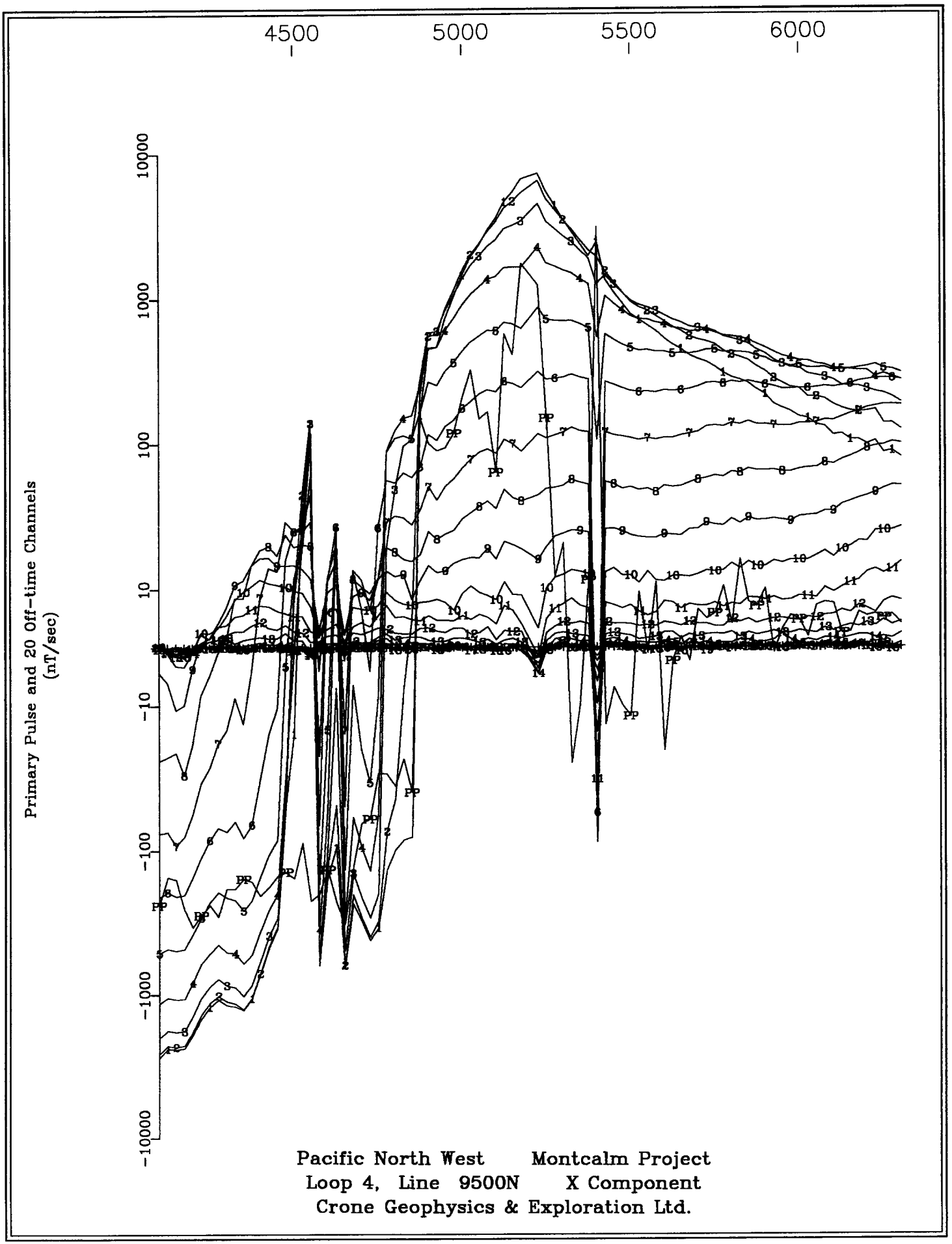
Pacific North West Montcalm Project
Loop 9, Line8100N X Component
Crone Geophysics & Exploration Ltd.



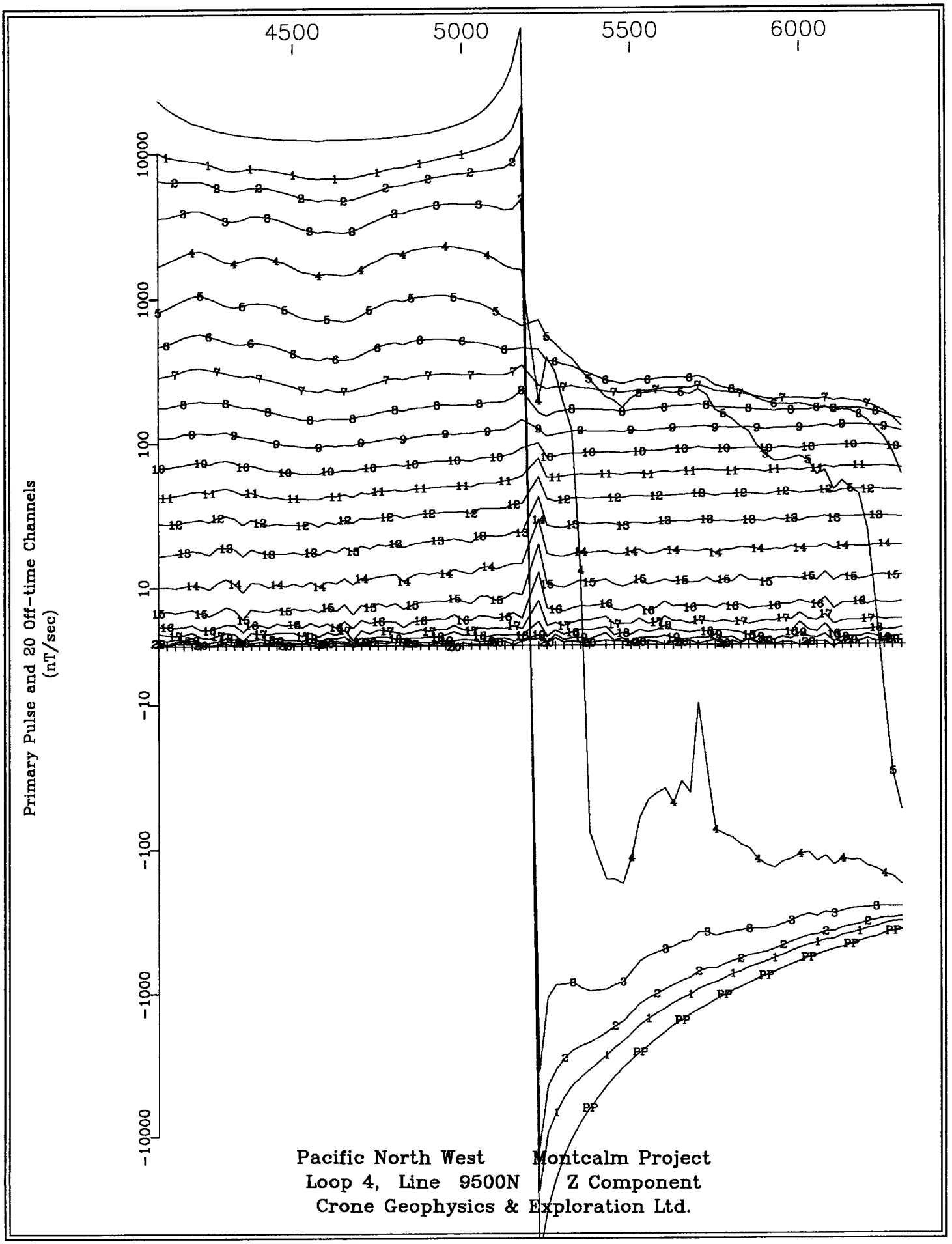
Pacific North West Montcalm Project
Loop 9, Line 8100N Z Component
Crone Geophysics & Exploration Ltd.

APPENDIX III

PULSE EM DATA PROFILES (LIN-LOG SCALE)



Pacific North West Montcalm Project
Loop 4, Line 9500N X Component
Crone Geophysics & Exploration Ltd.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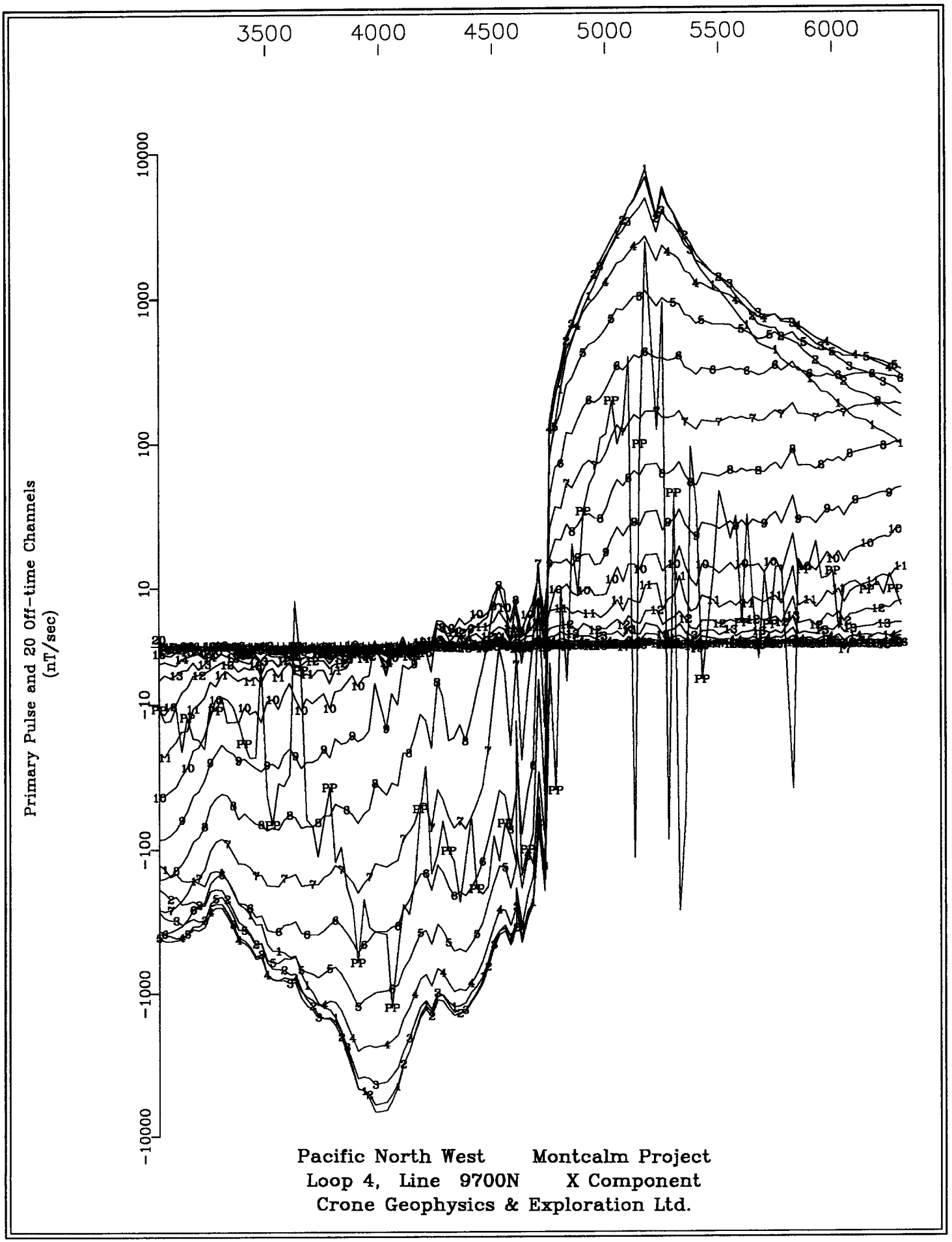
Pacific North West
Loop 4, Line 9500N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component



Pacific North West Montcalm Project
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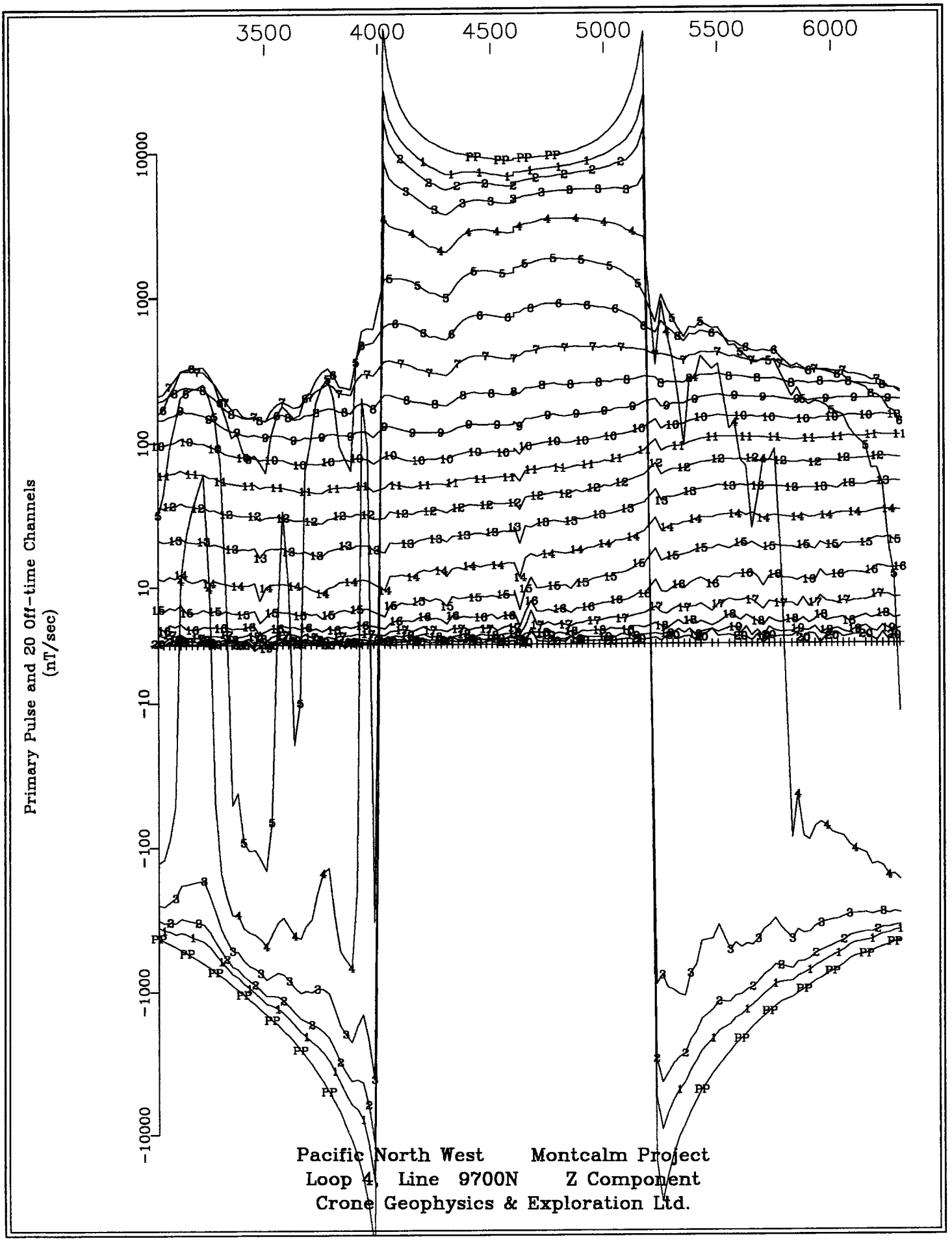
Crone Geophysics & Exploration Ltd.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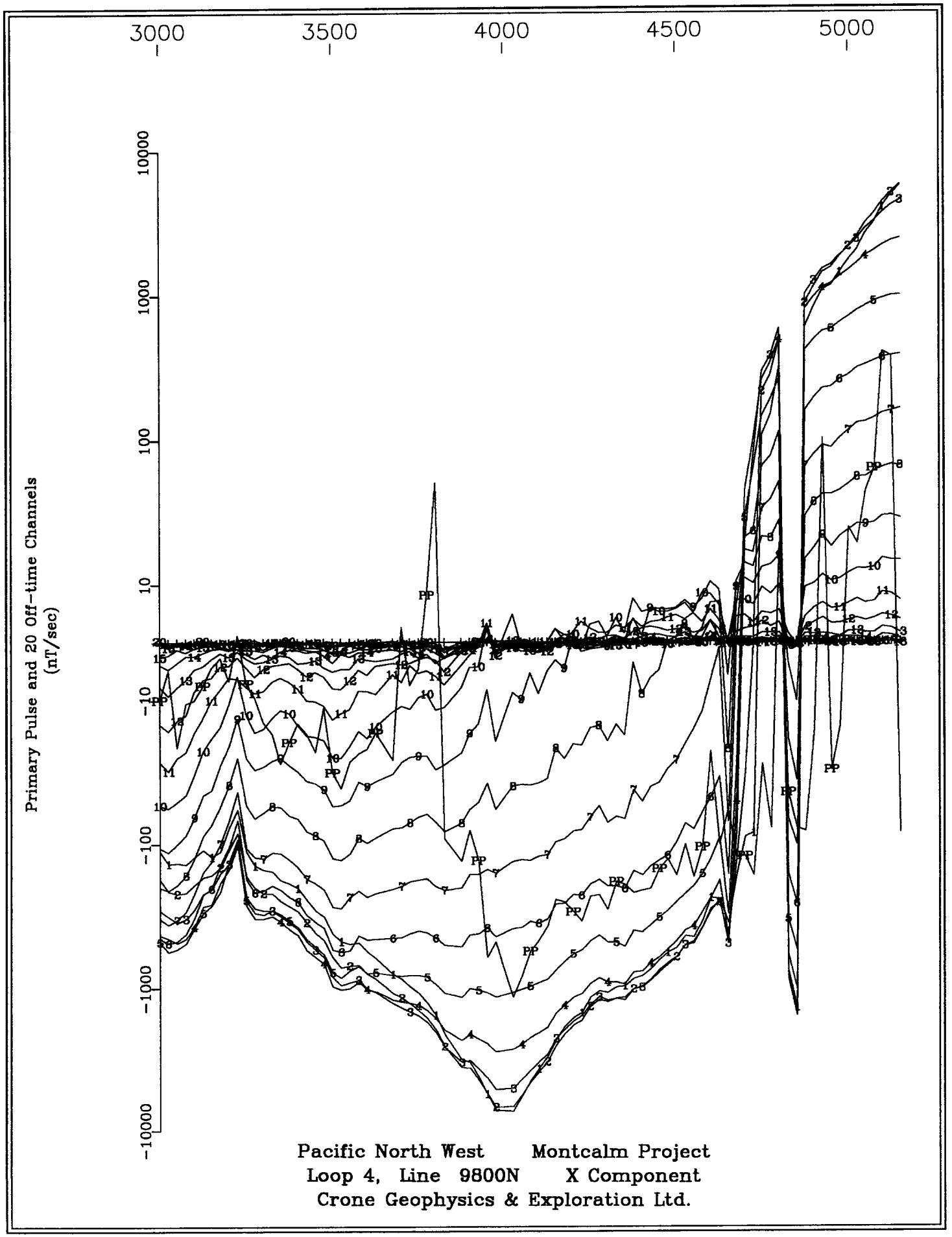
Pacific North West Montcalm Project
Loop 4, Line 9700N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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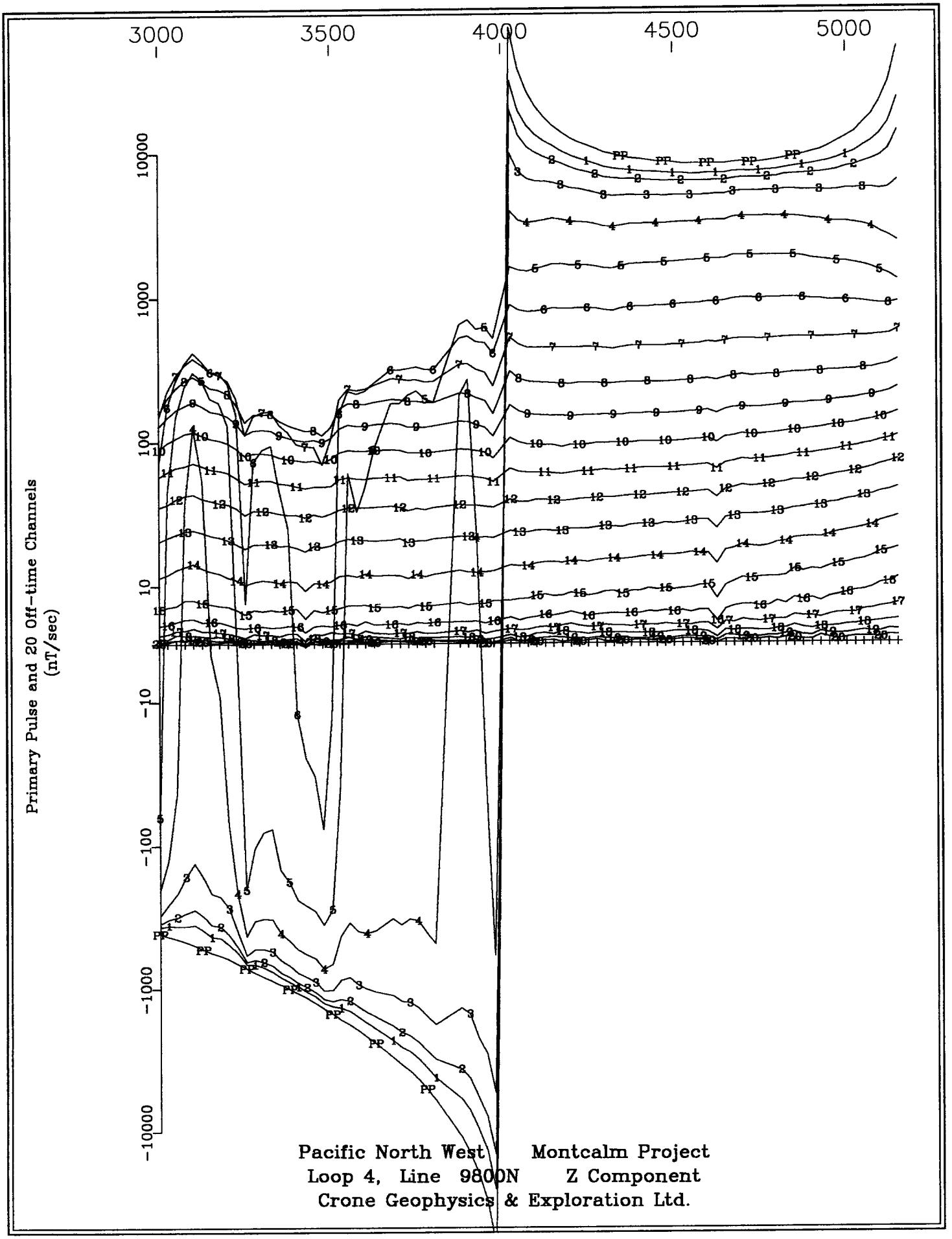
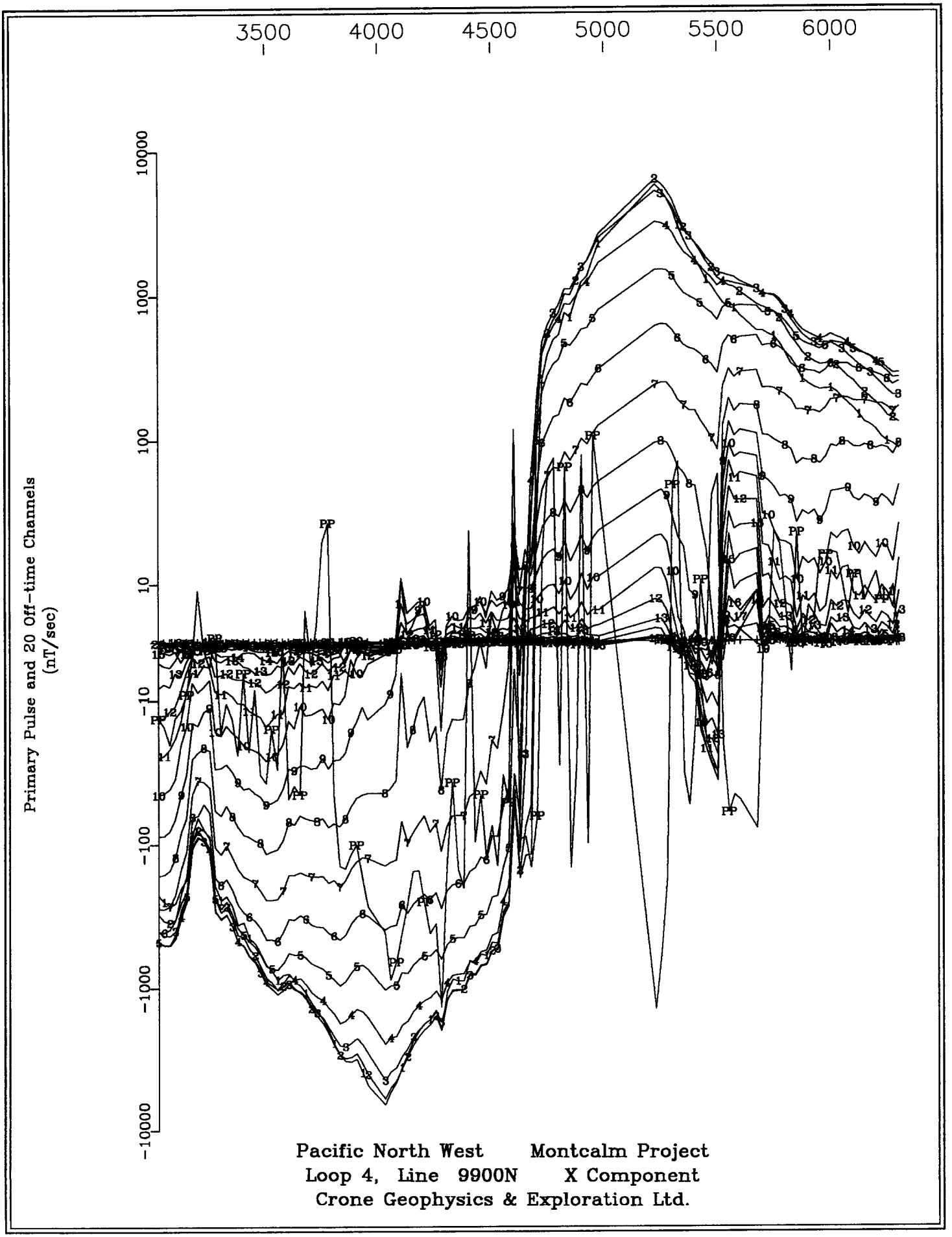
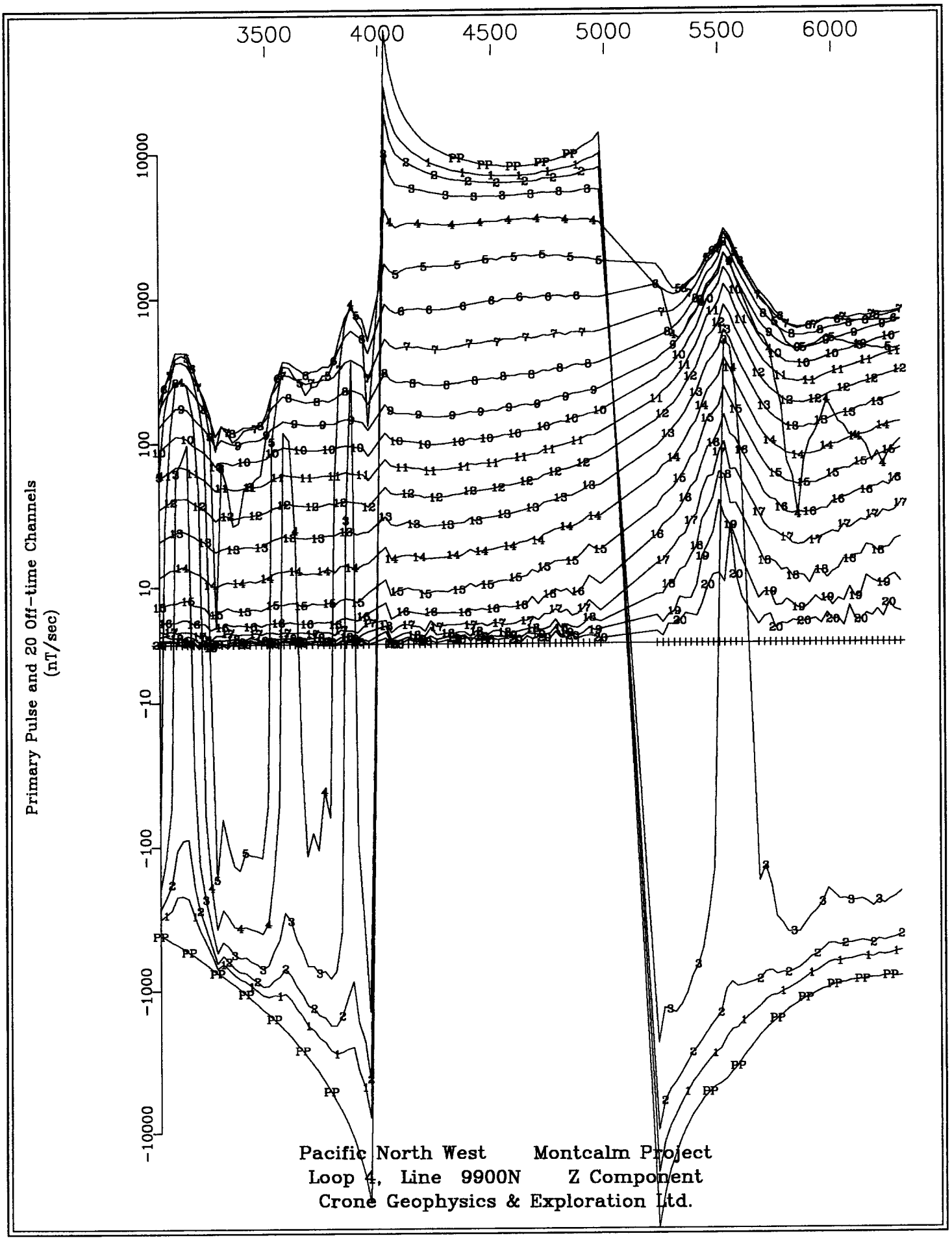
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 9800N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 9900N X Component
Crone Geophysics & Exploration Ltd.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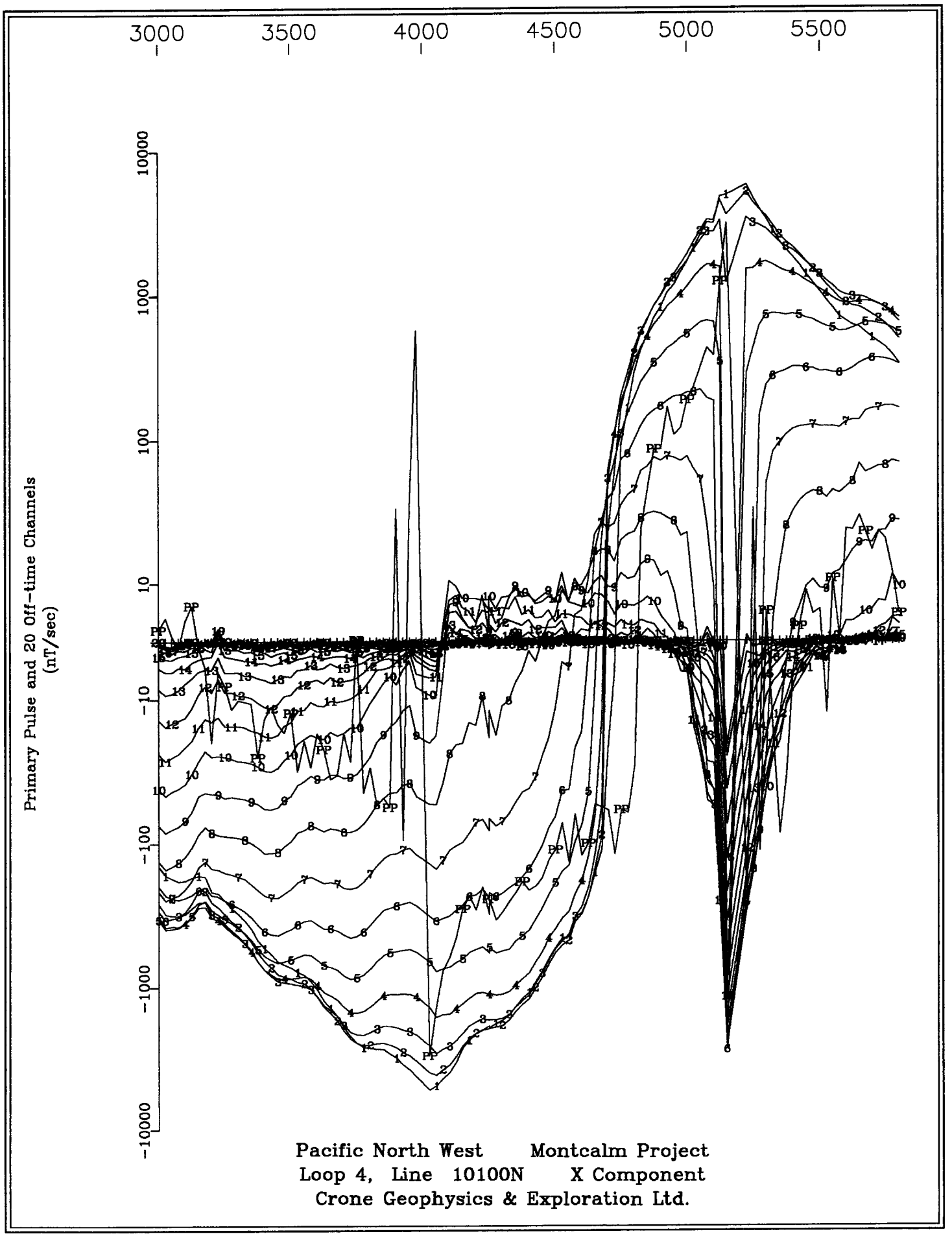
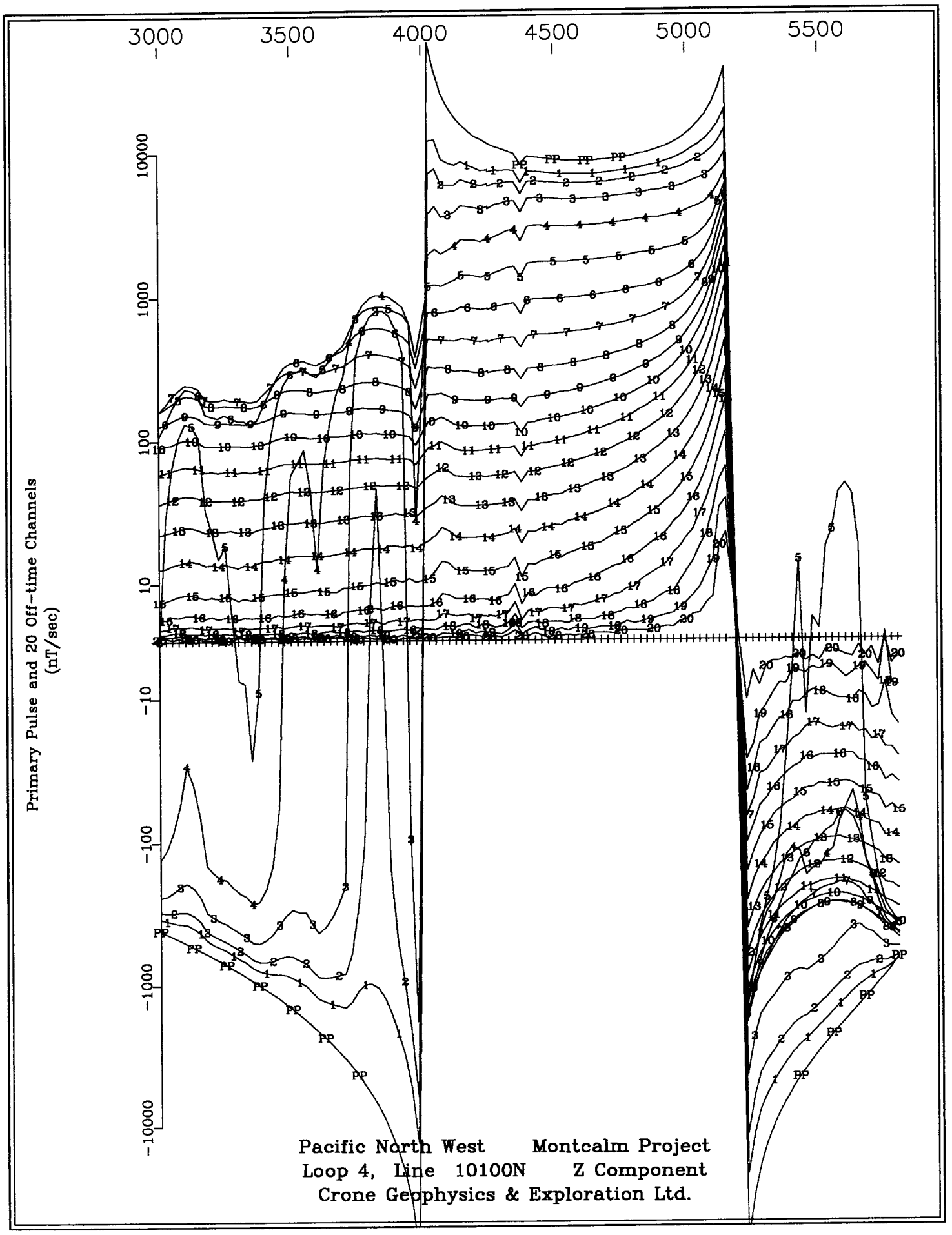
Pacific North West Montcalm Project
Loop 4, Line 9900N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 10100N X Component
Crone Geophysics & Exploration Ltd.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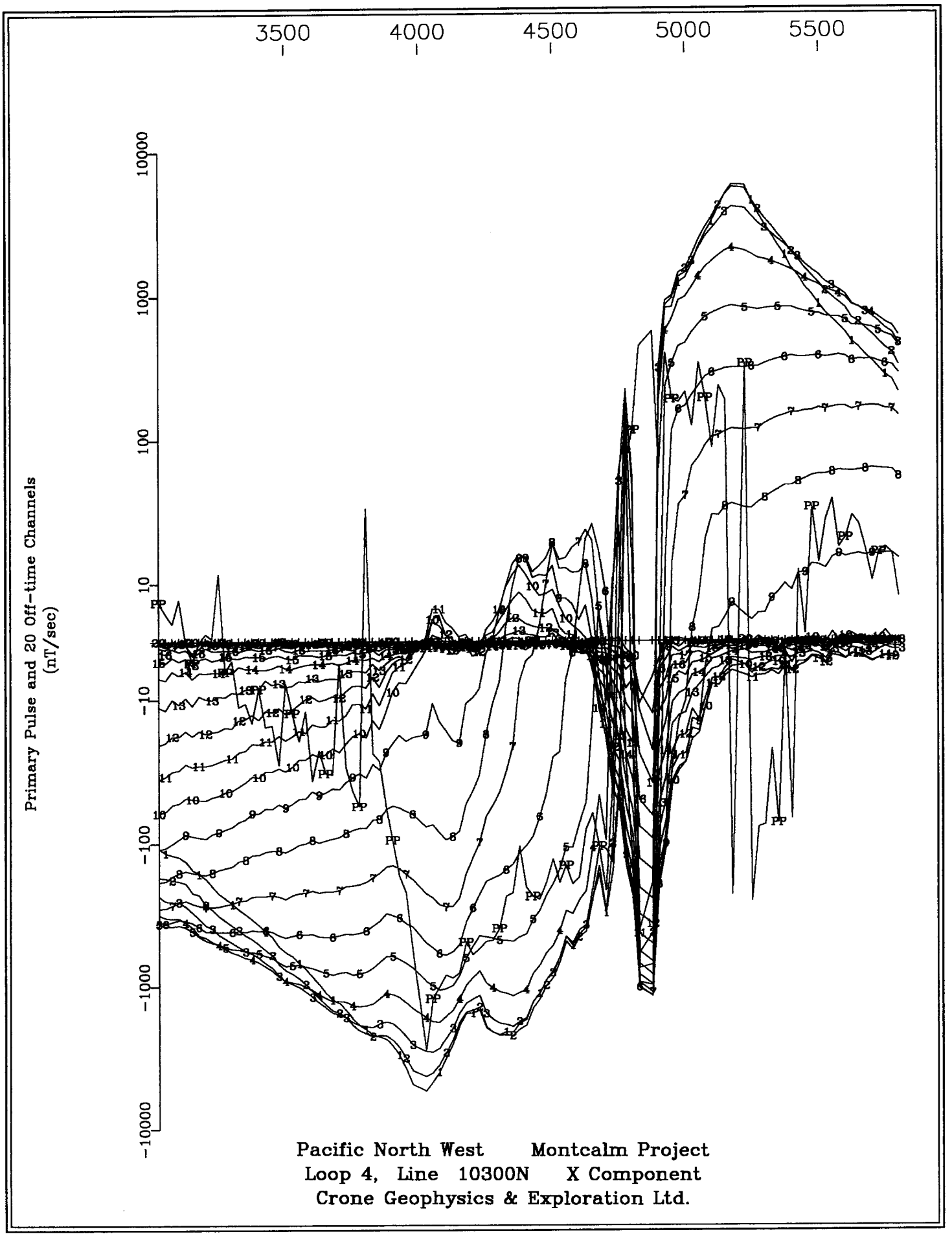
Pacific North West Montcalm Project
Loop 4, Line 10100N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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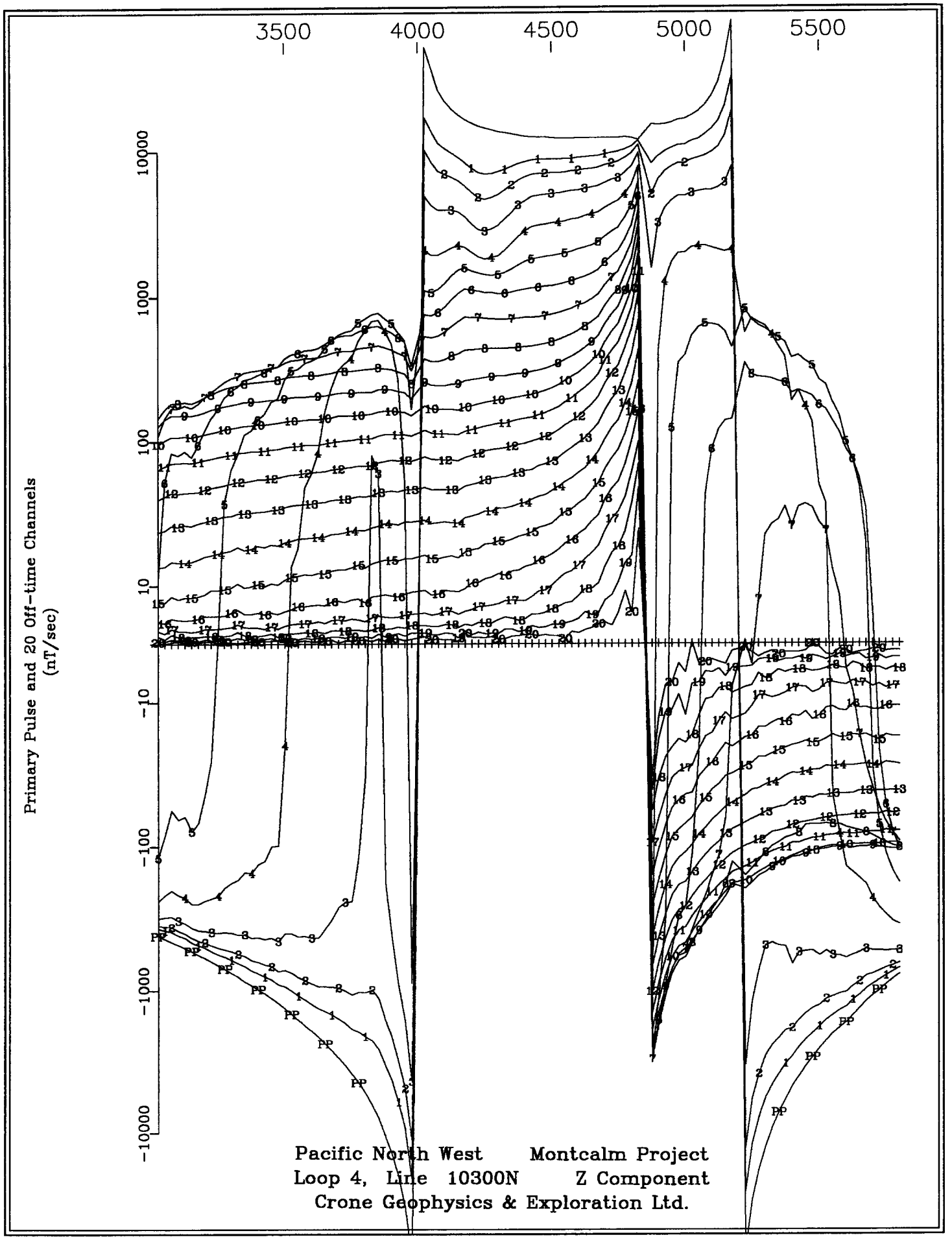
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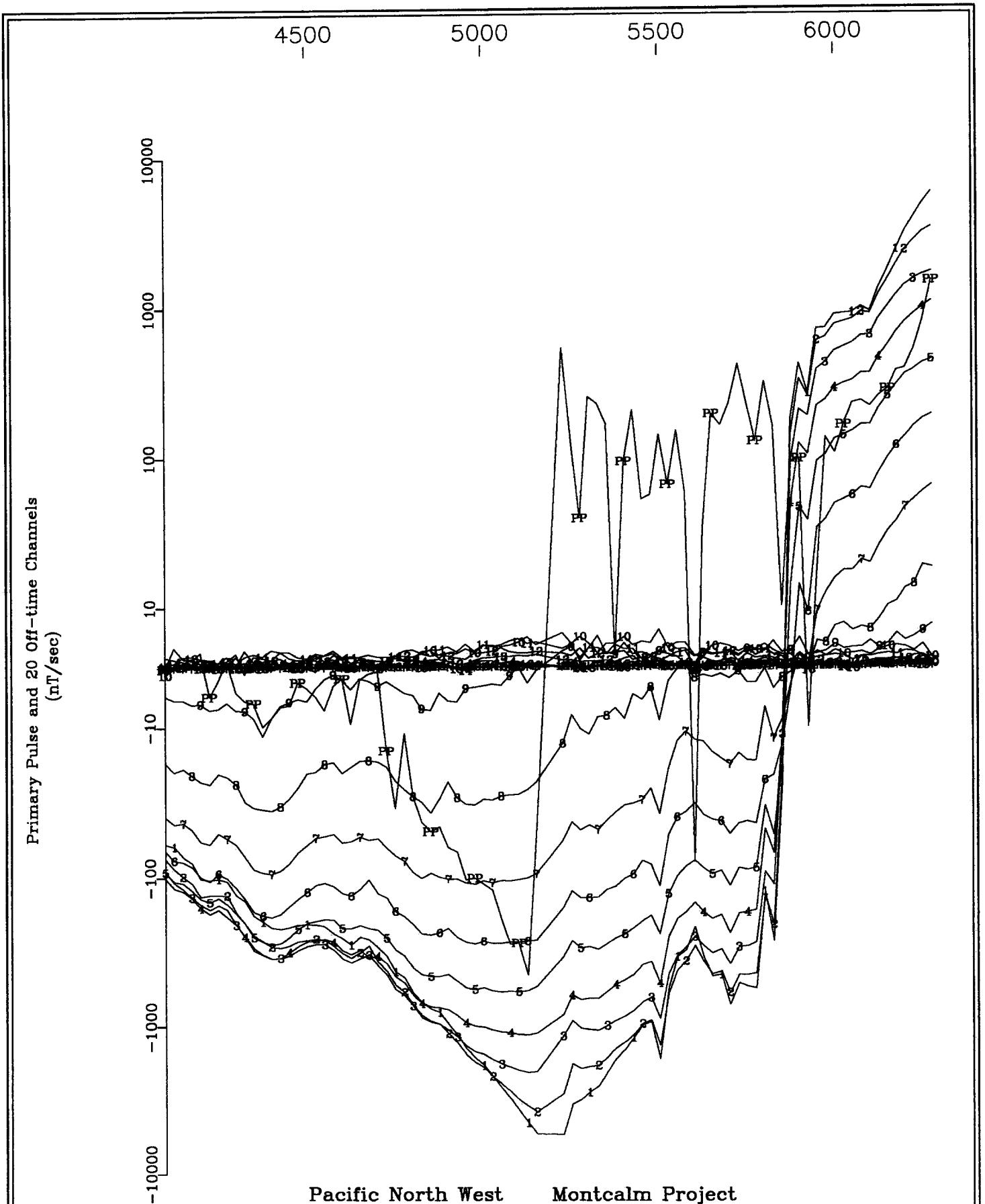
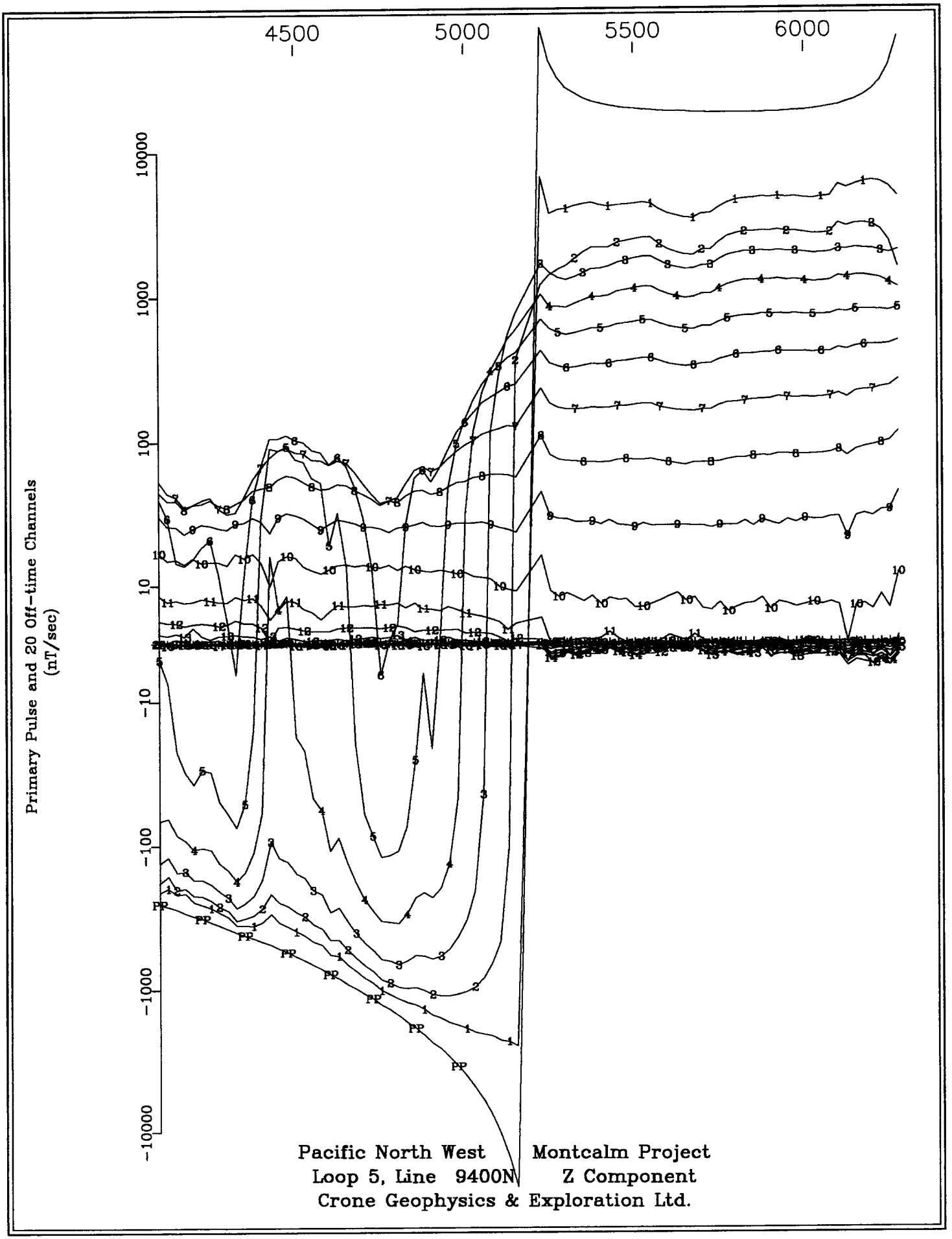
Pacific North West Montcalm Project
Loop 4, Line 10300N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 5, Line 9400N X Component
Crone Geophysics & Exploration Ltd.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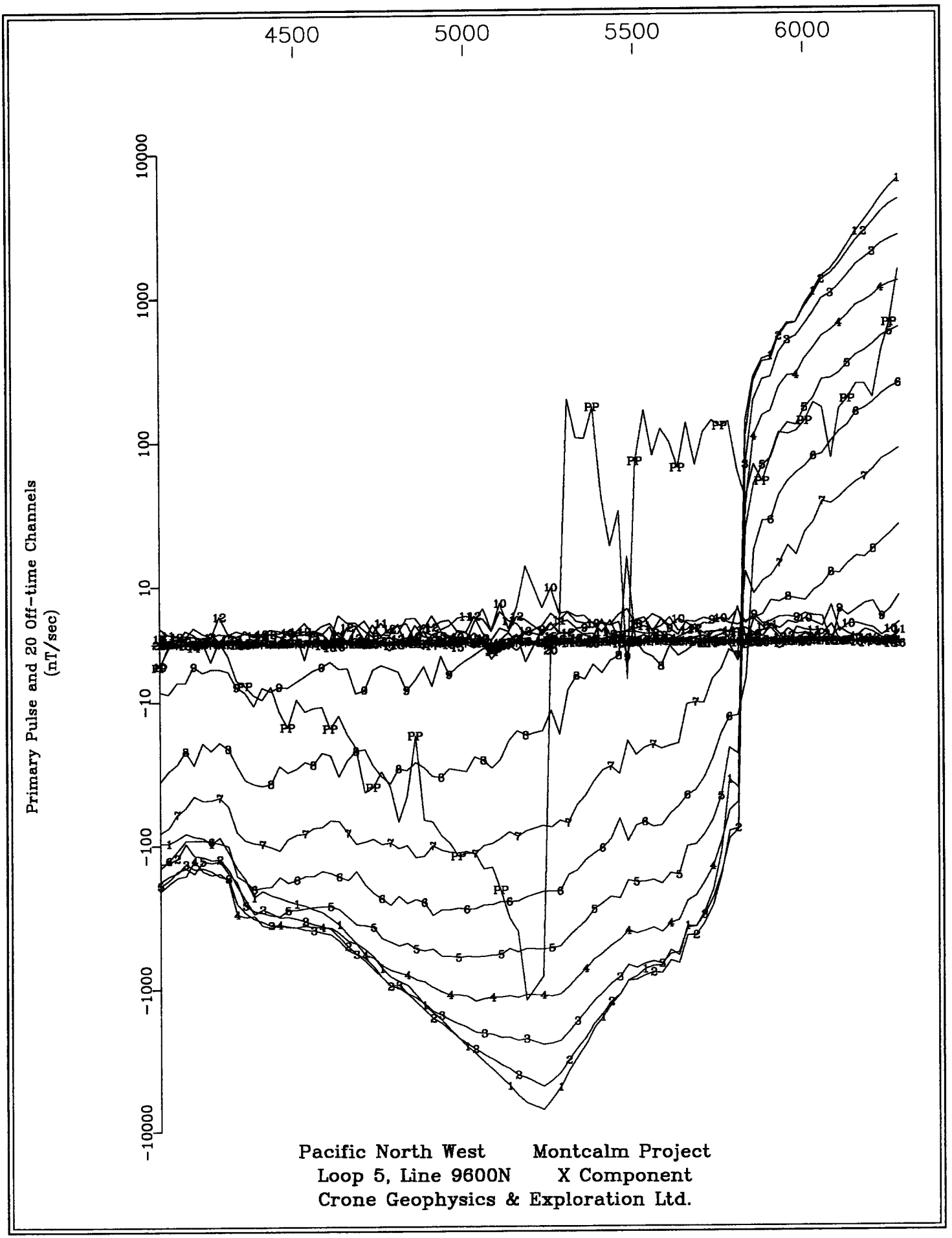
Pacific North West
Loop 5, Line 9400N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component



Pacific North West Montcalm Project
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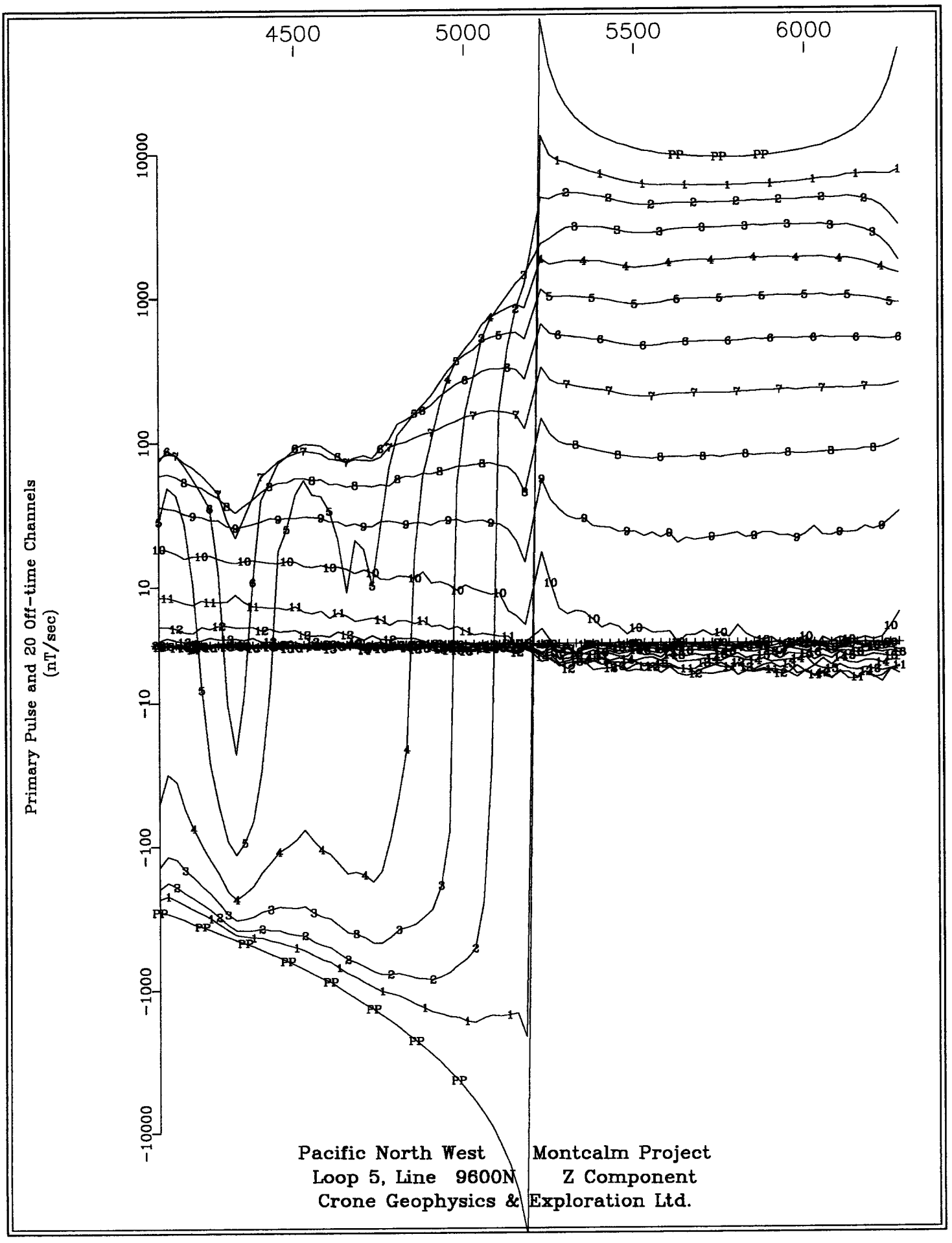
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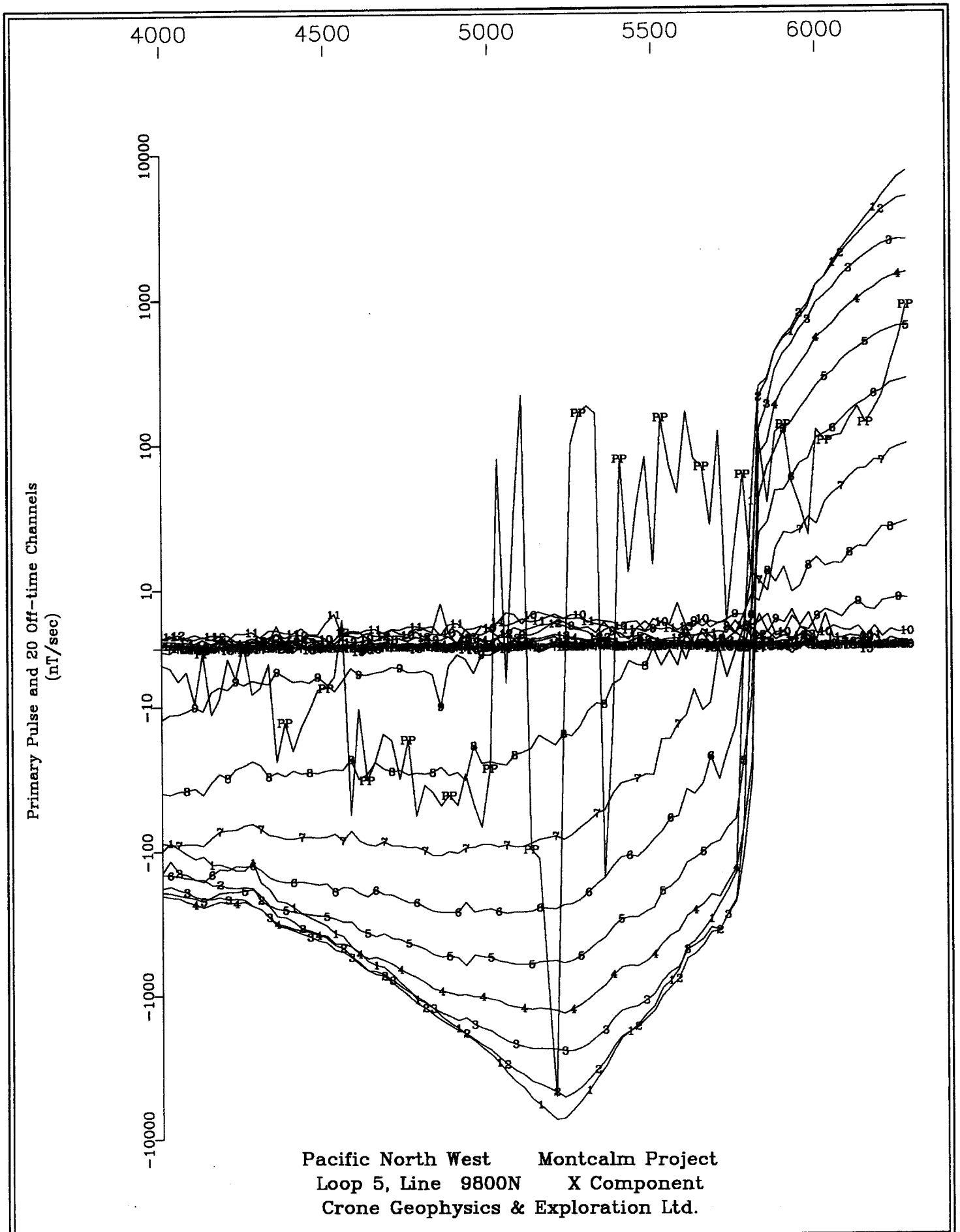
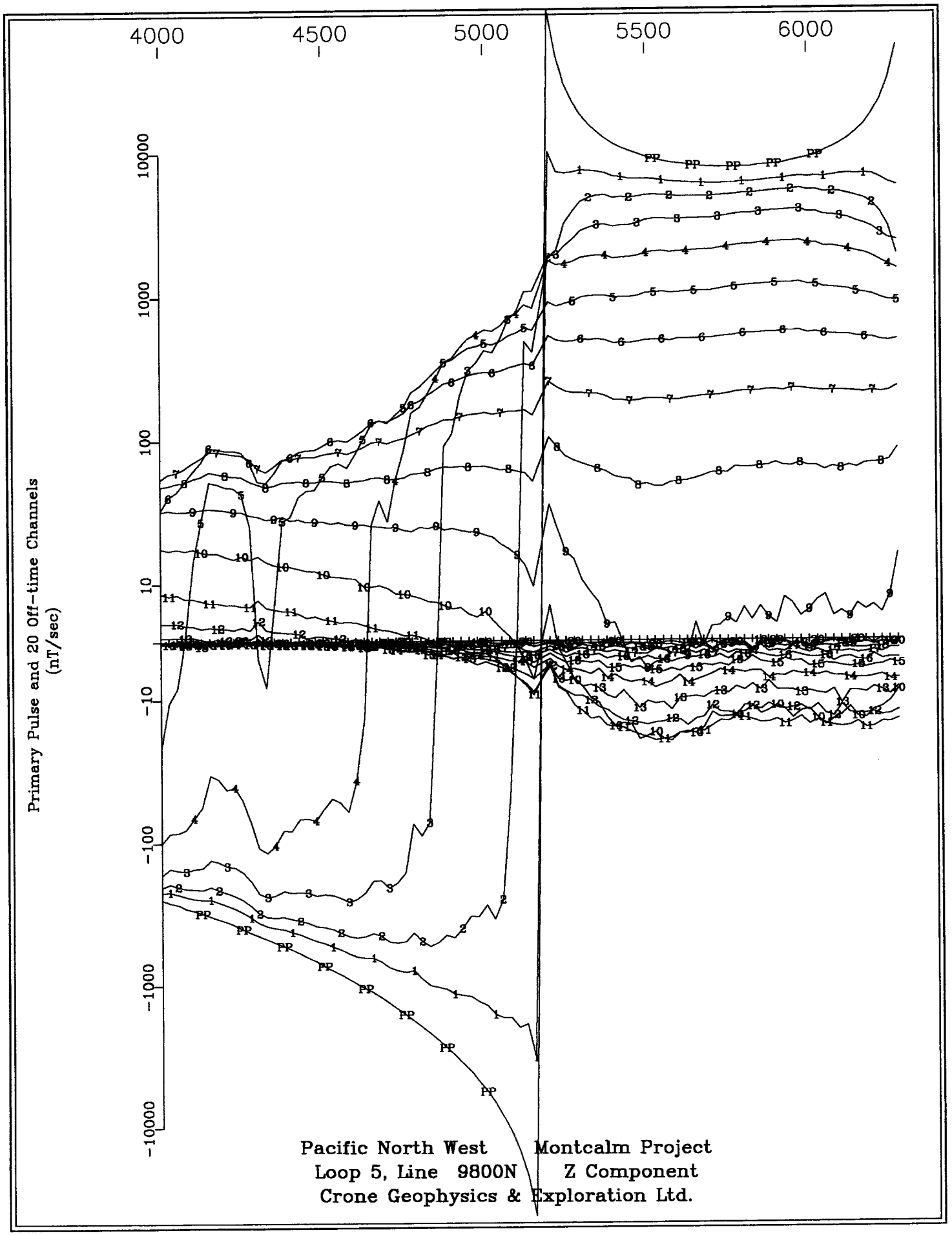
Loop 5, Line 9600N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component



Pacific North West Montcalm Project
Loop 5, Line 9800N X Component
Crone Geophysics & Exploration Ltd.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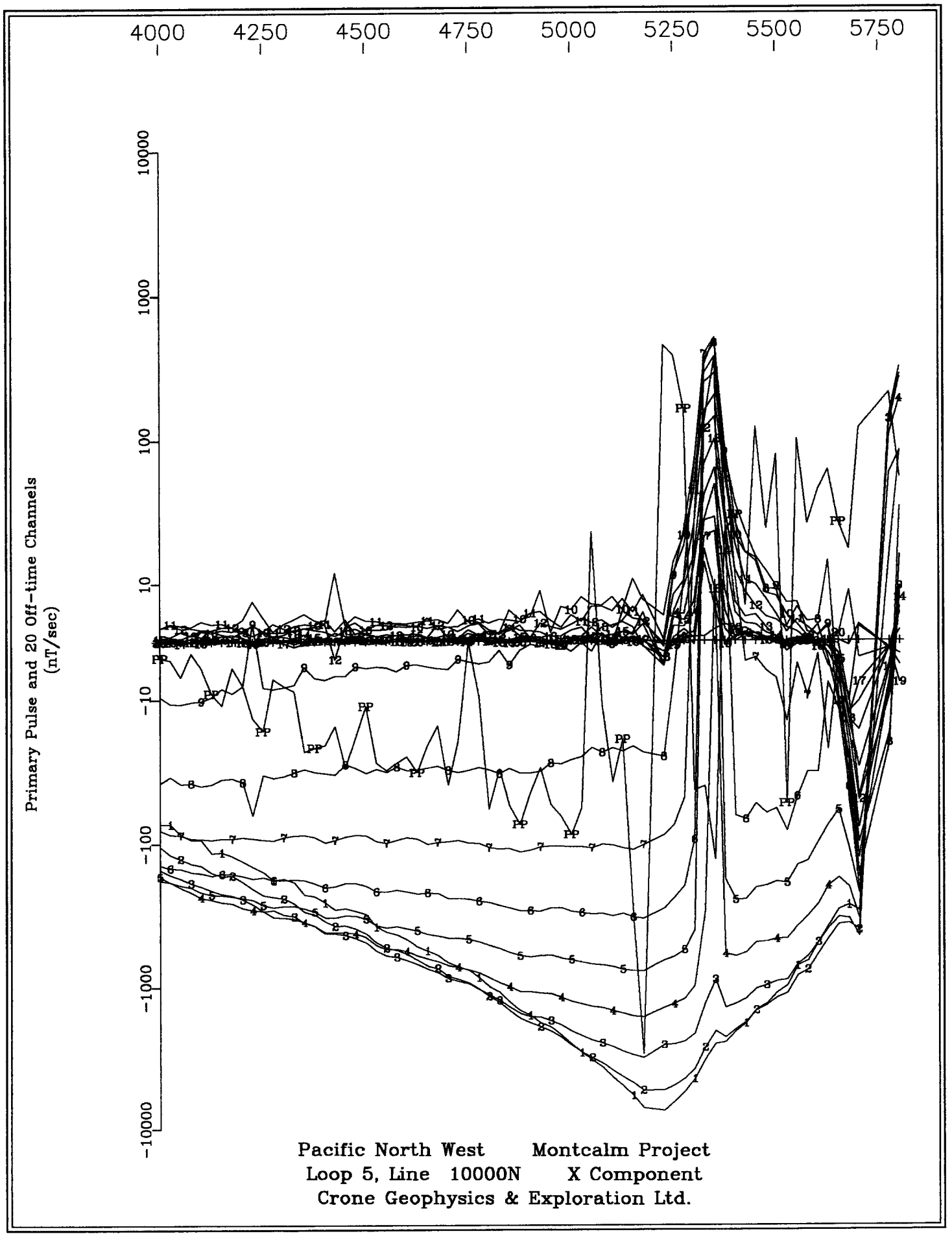
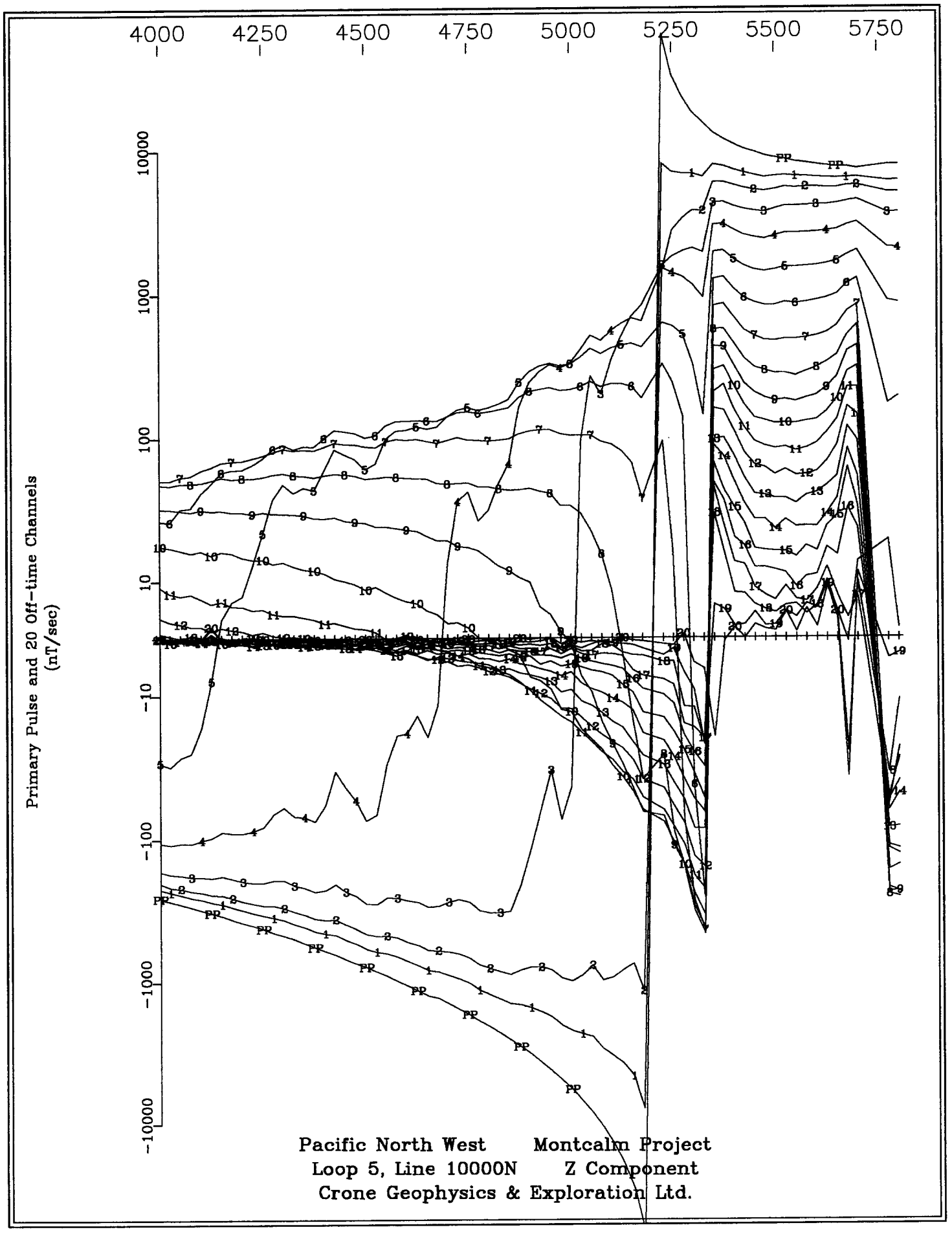
Pacific North West
Loop 5, Line 9800N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component



Pacific North West Montcalm Project
Loop 5, Line 10000N X Component
Crone Geophysics & Exploration Ltd.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Pacific North West Montcalm Project
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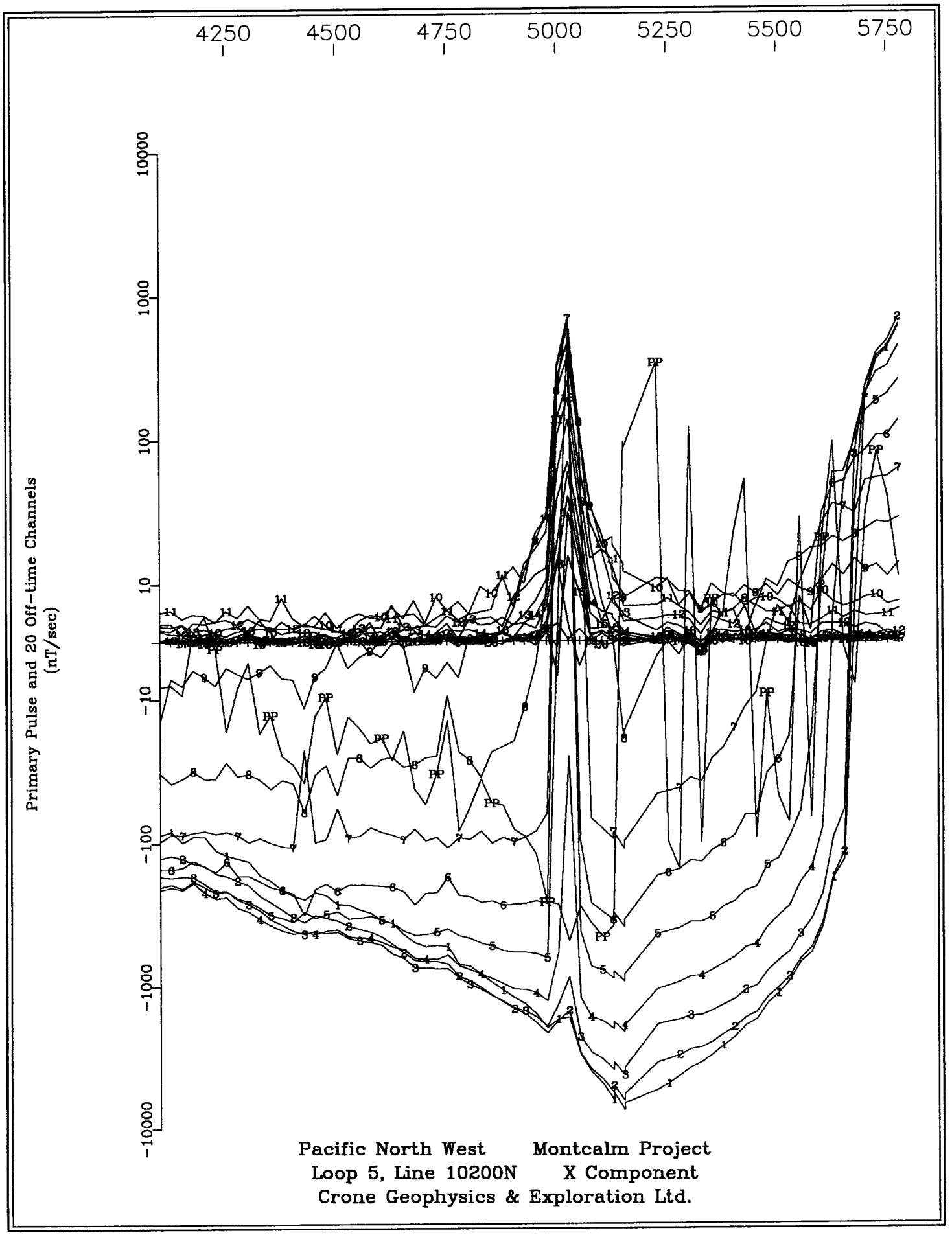
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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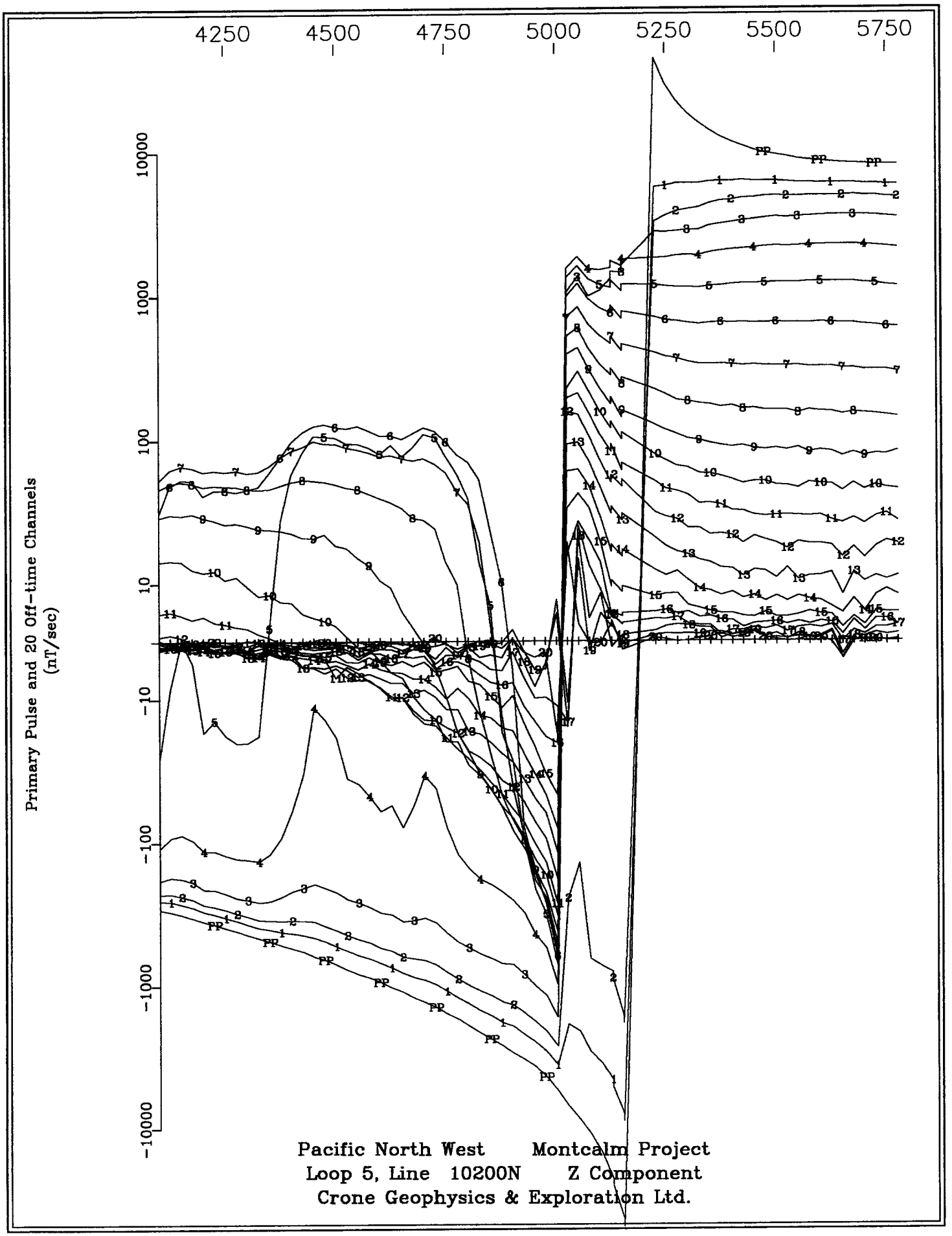
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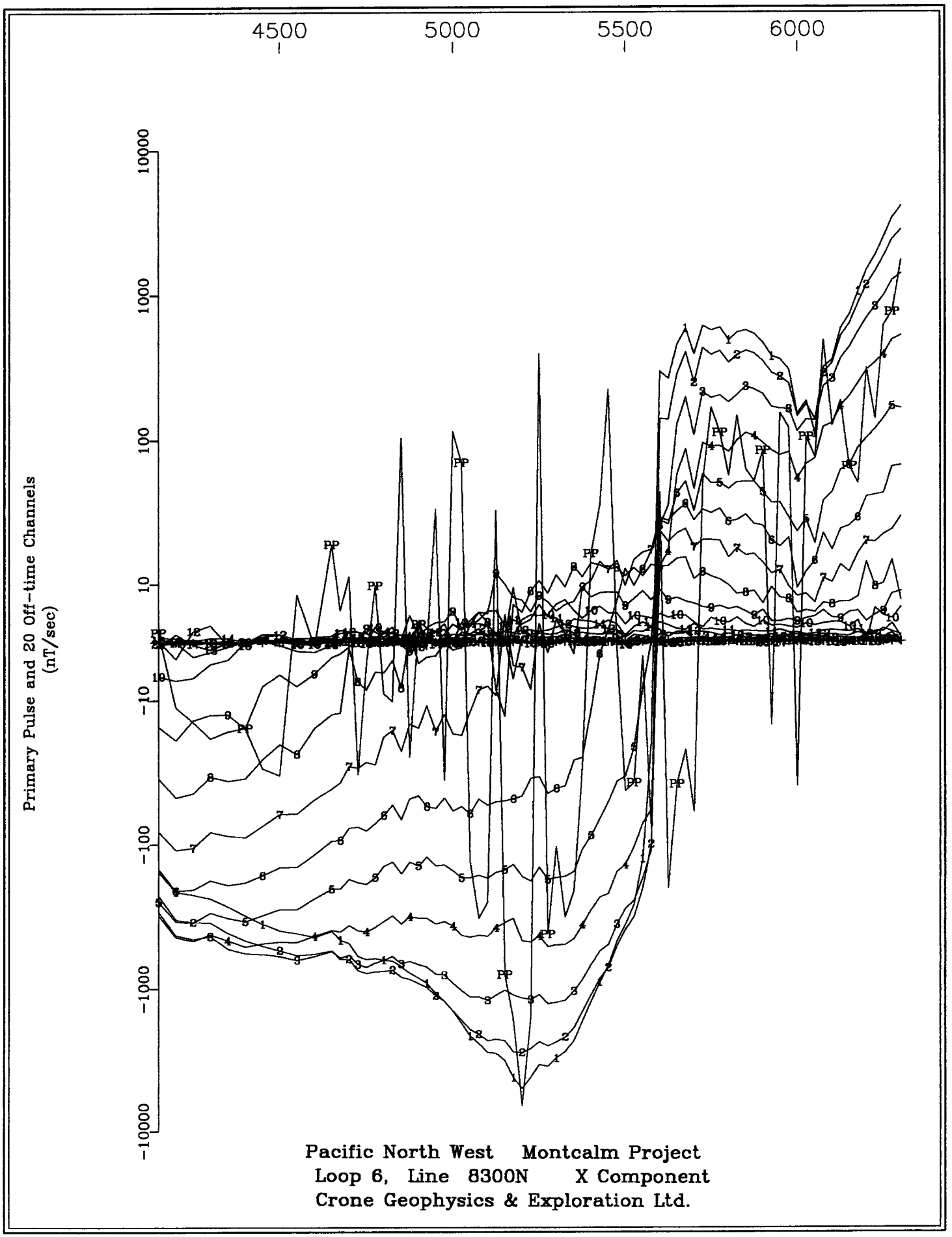
Pacific North West Montcalm Project
Loop 5, Line 10200N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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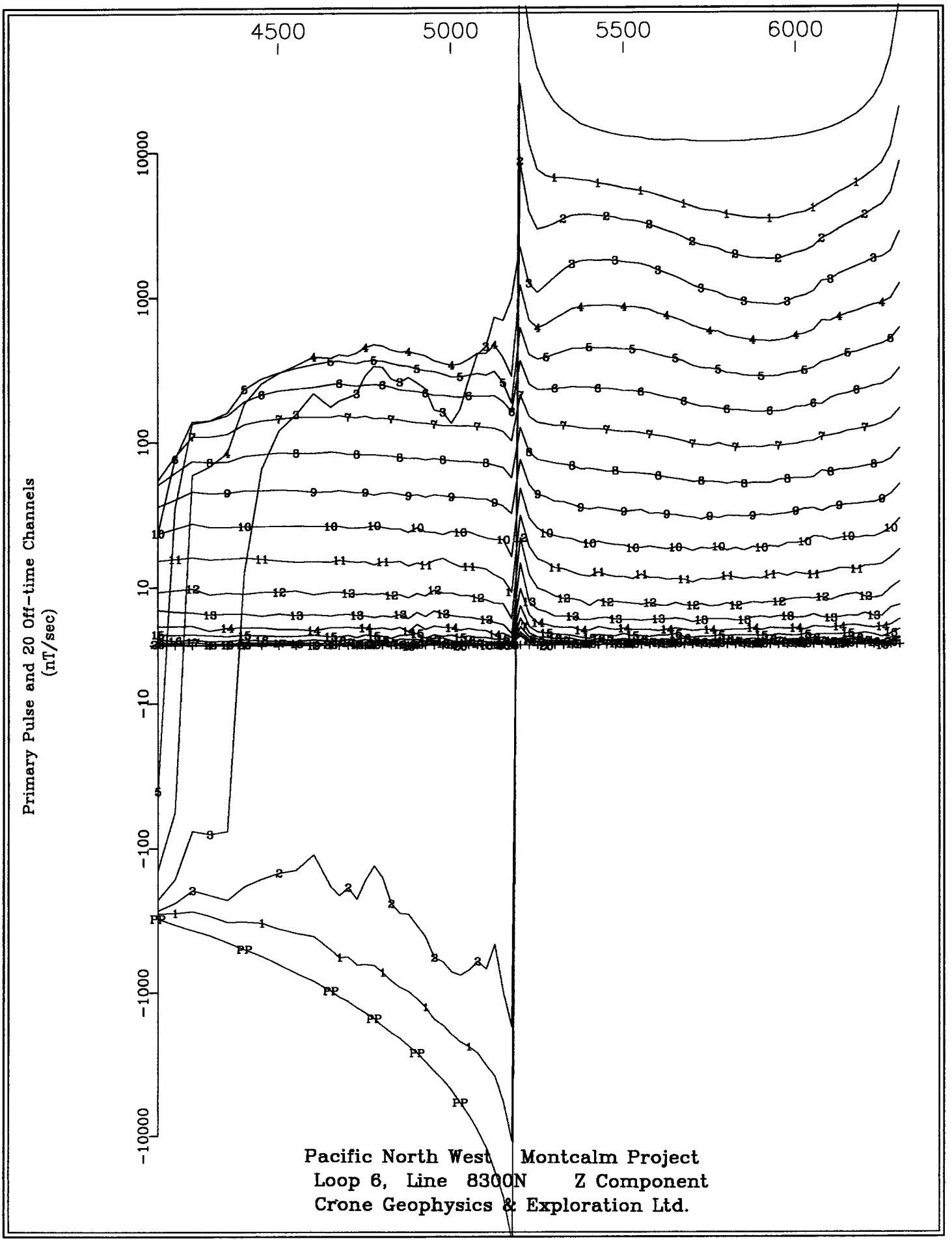

Pacific North West Montcalm Project
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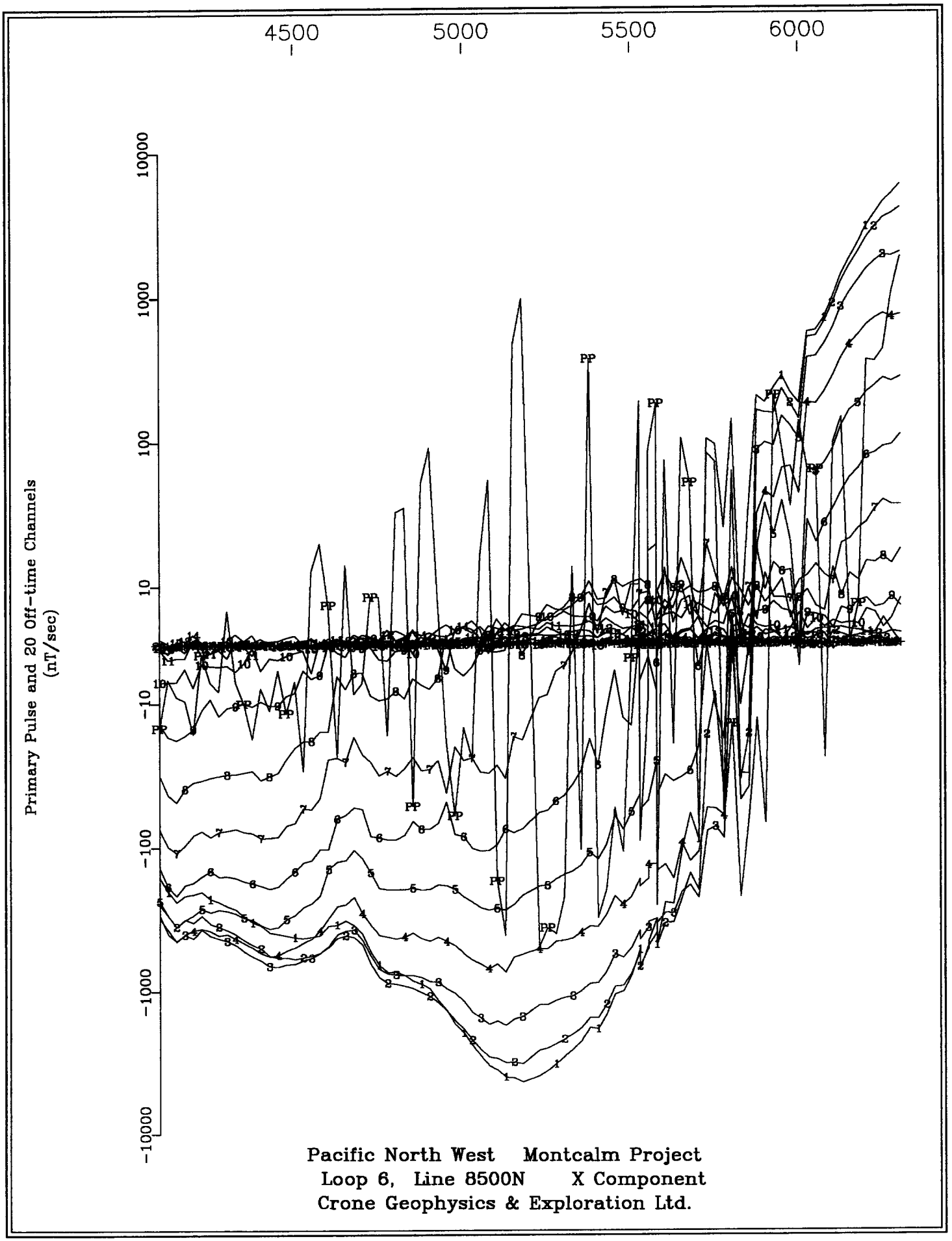

Pacific North West Montcalm Project
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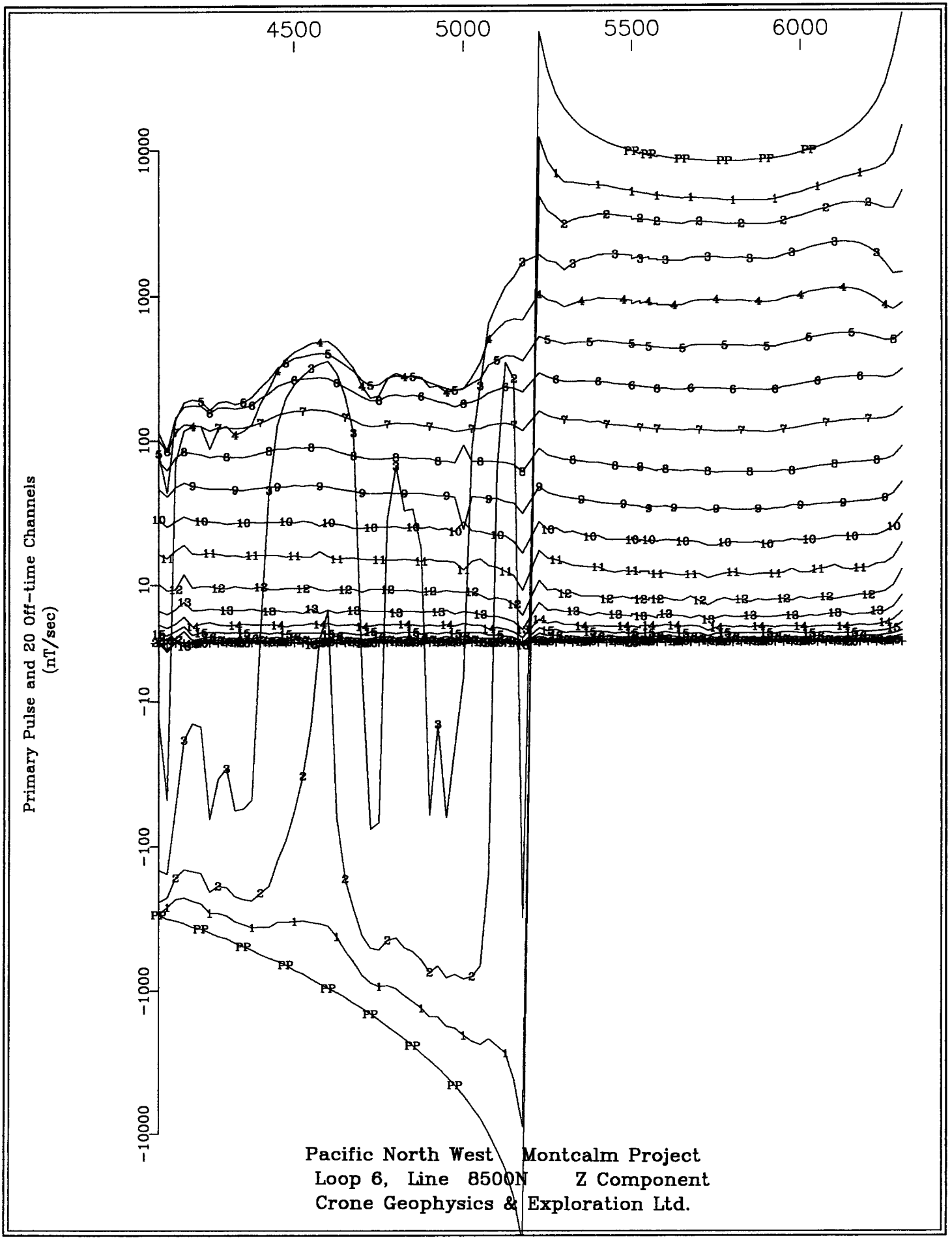

Pacific North West Montcalm Project
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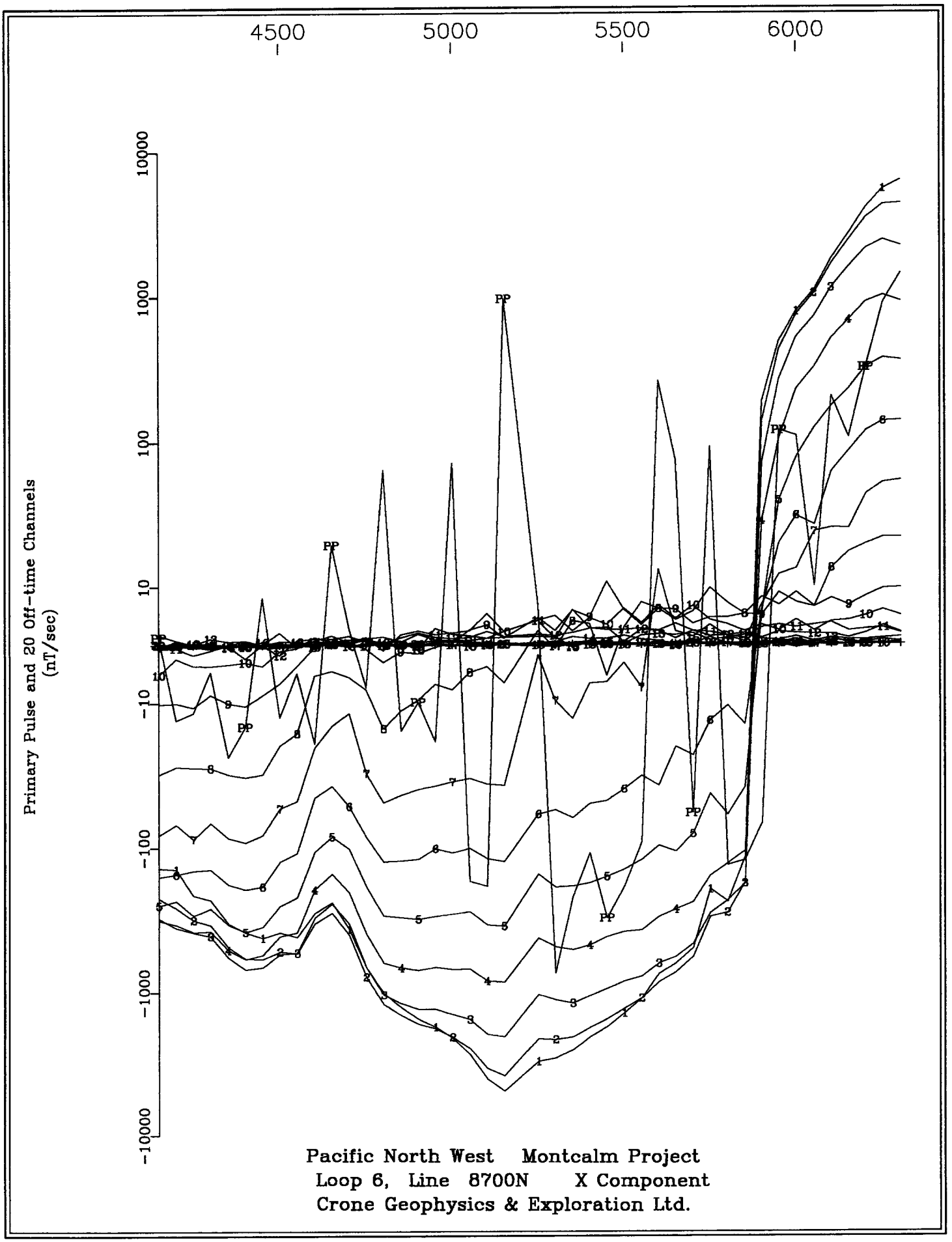
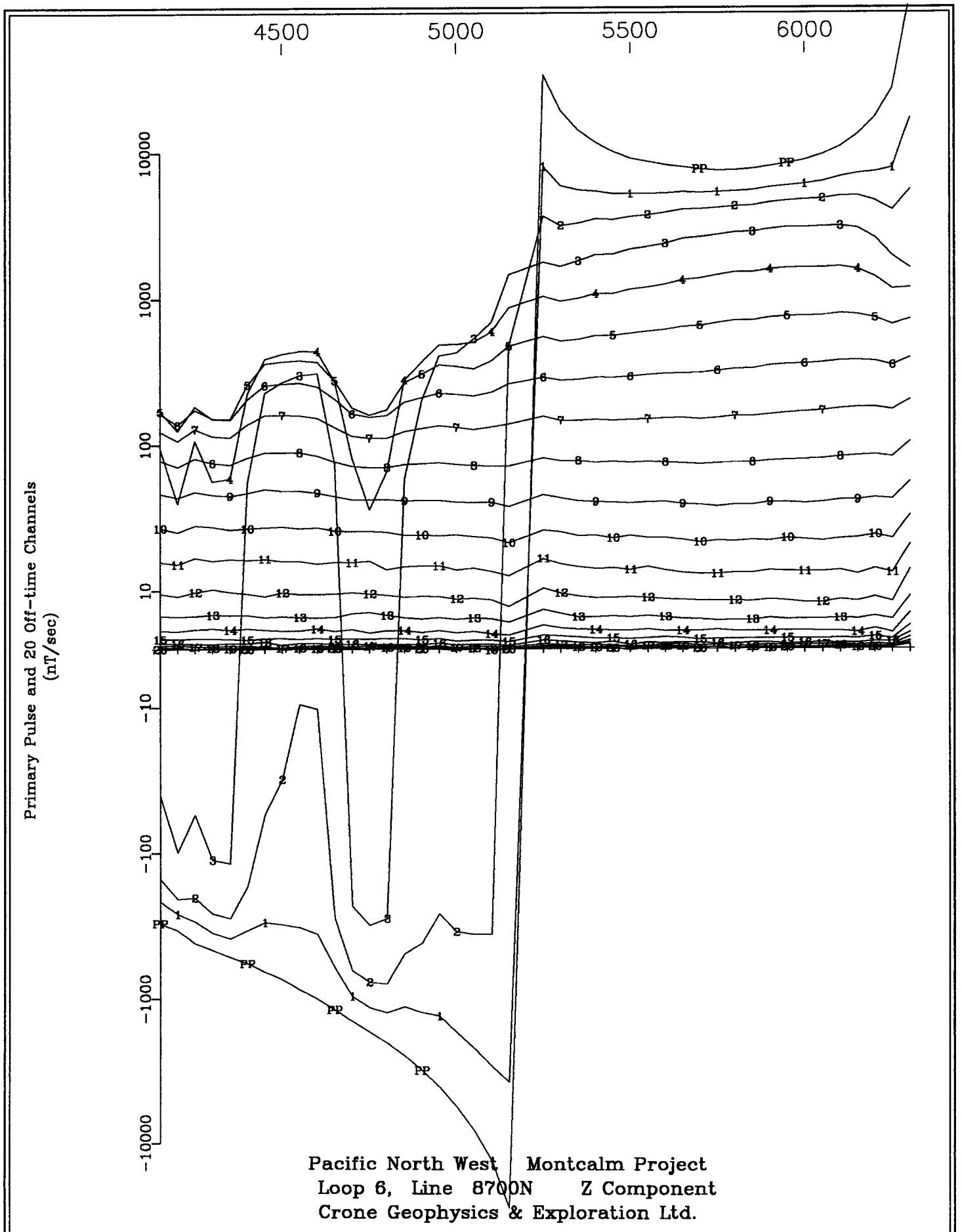


Pacific North West Montcalm Project
Loop 6, Line 8700N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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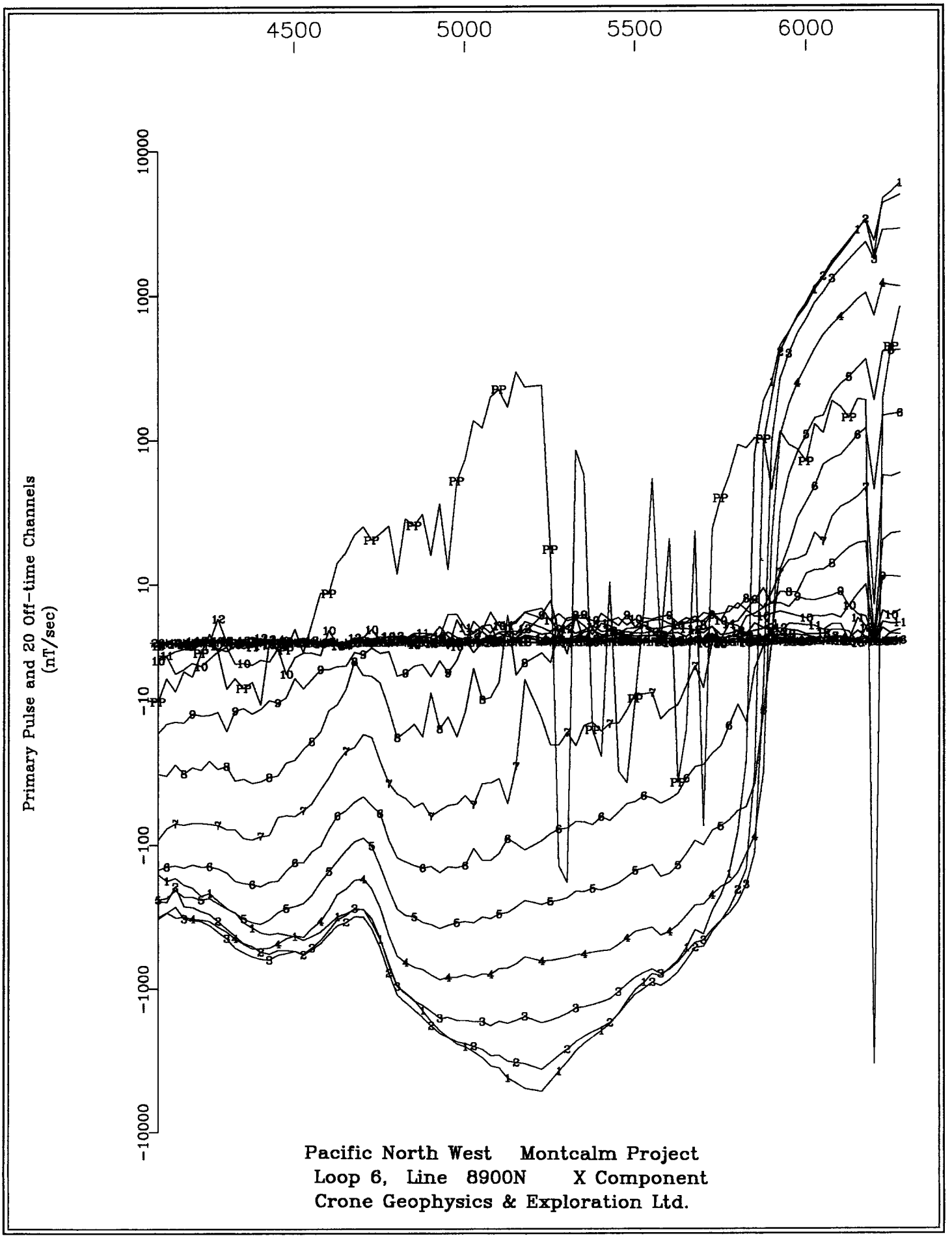

Pacific North West Montcalm Project
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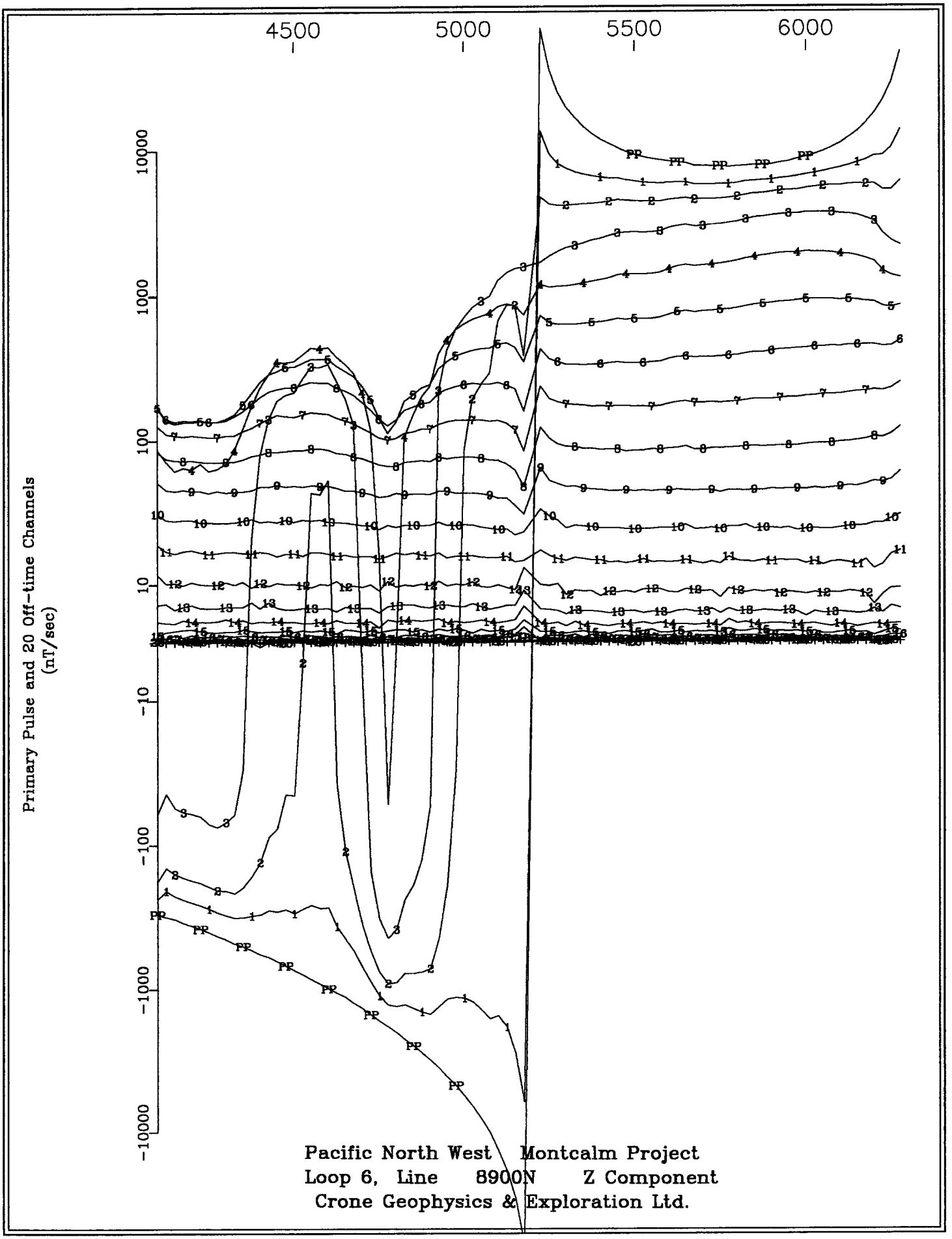
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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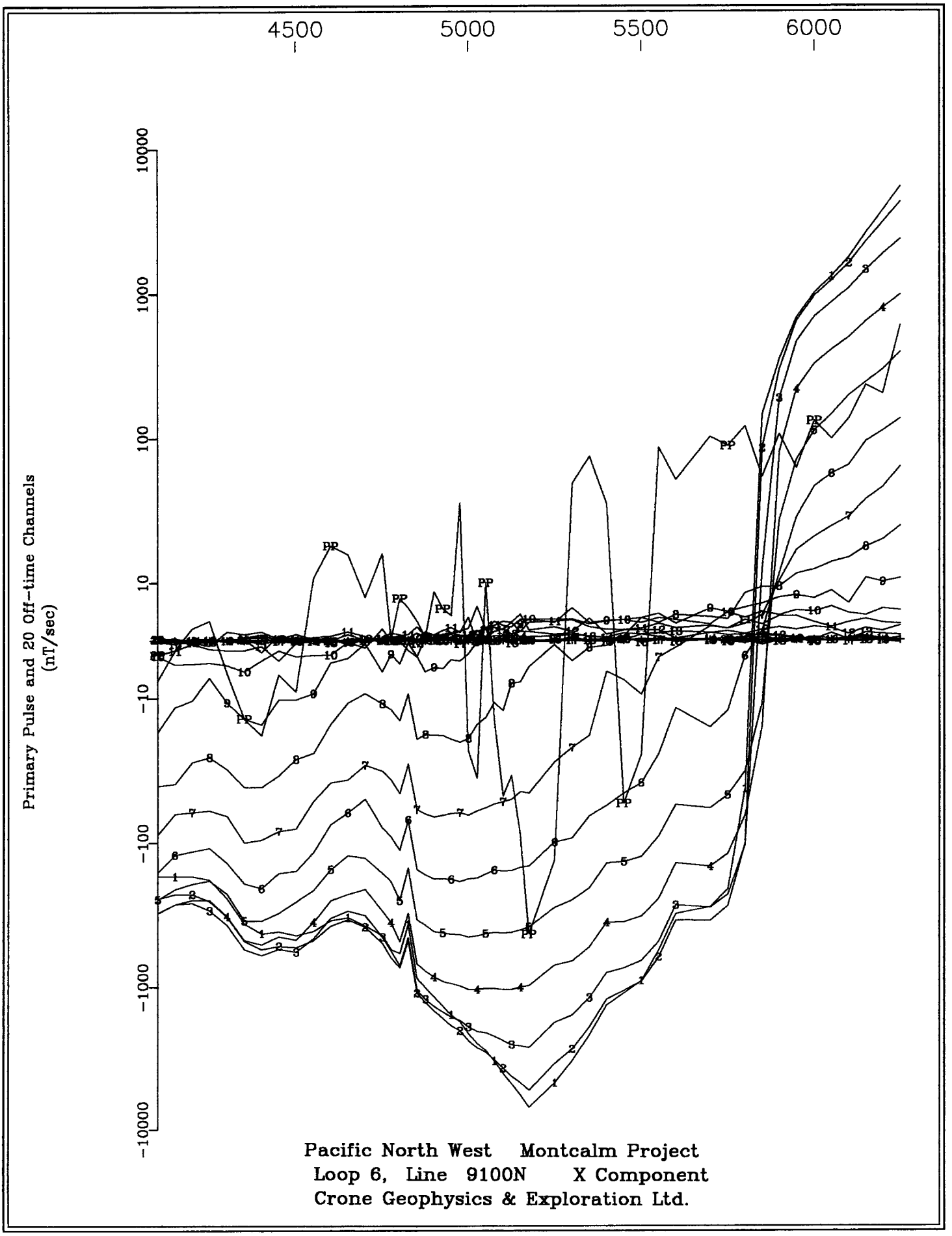

Pacific North West Montcalm Project
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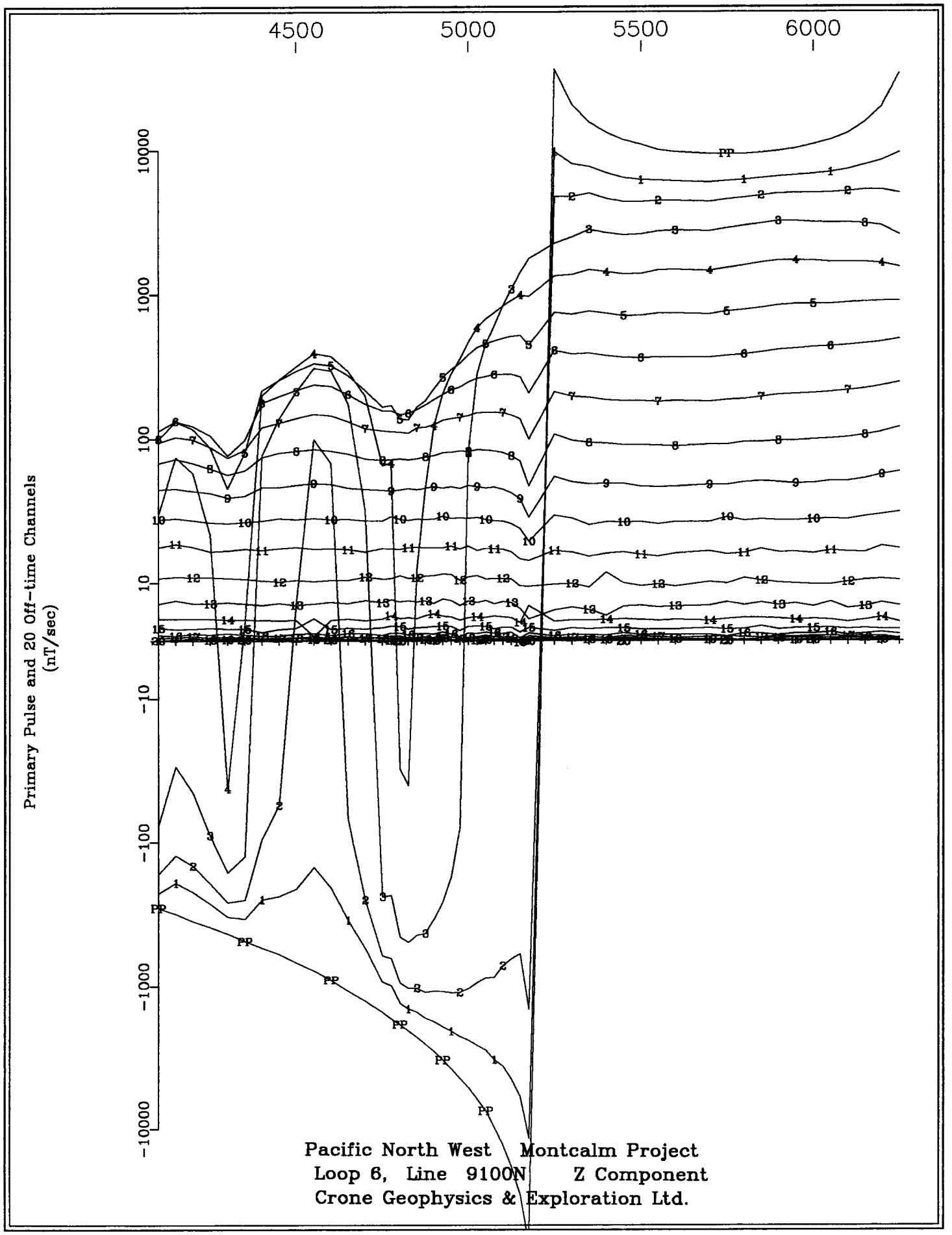
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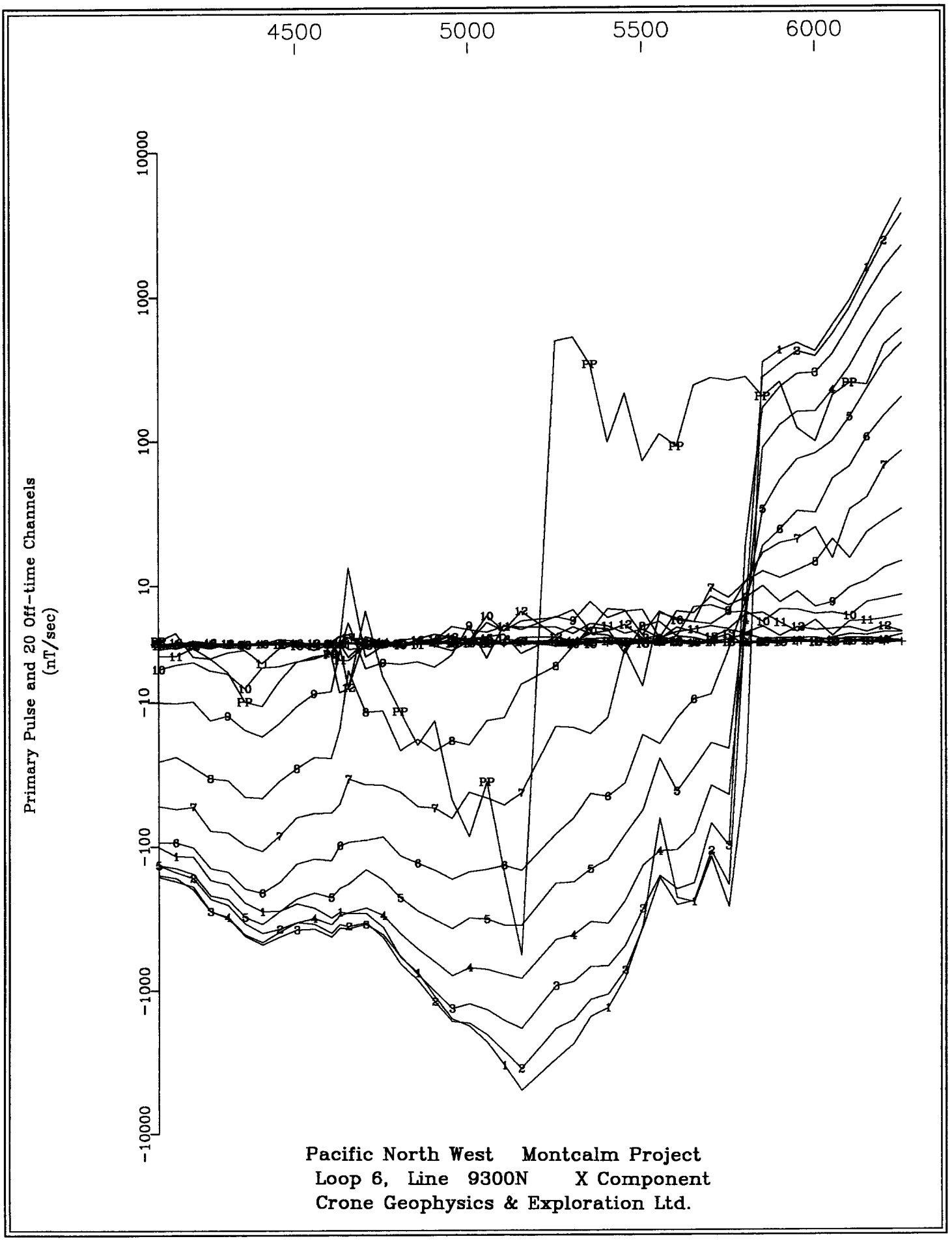
(nT/sec)
Pacific North West Montcalm Project
Loop 6, Line 9100N Z Component
Crone Geophysics & Exploration Ltd.



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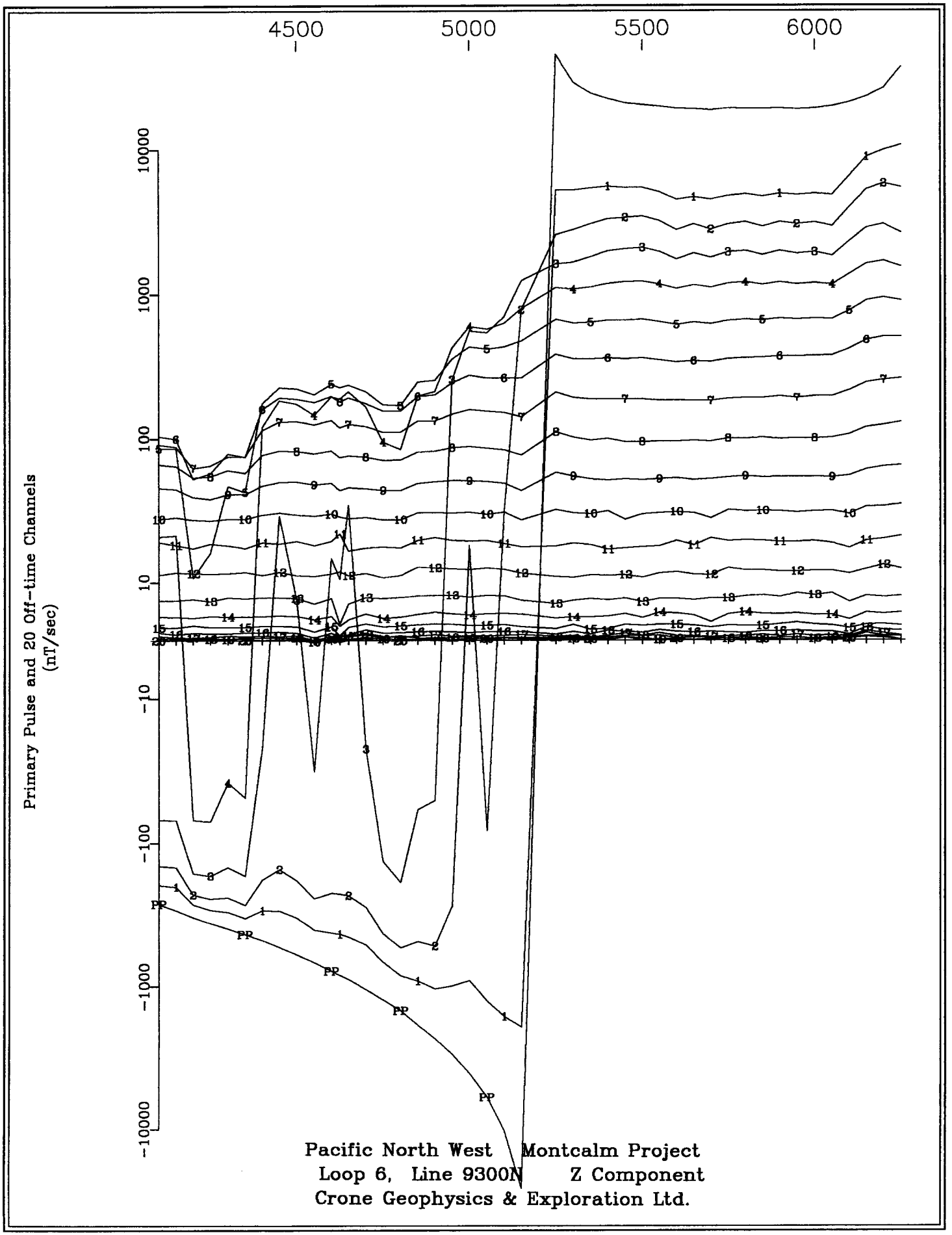

Pacific North West Montcalm Project
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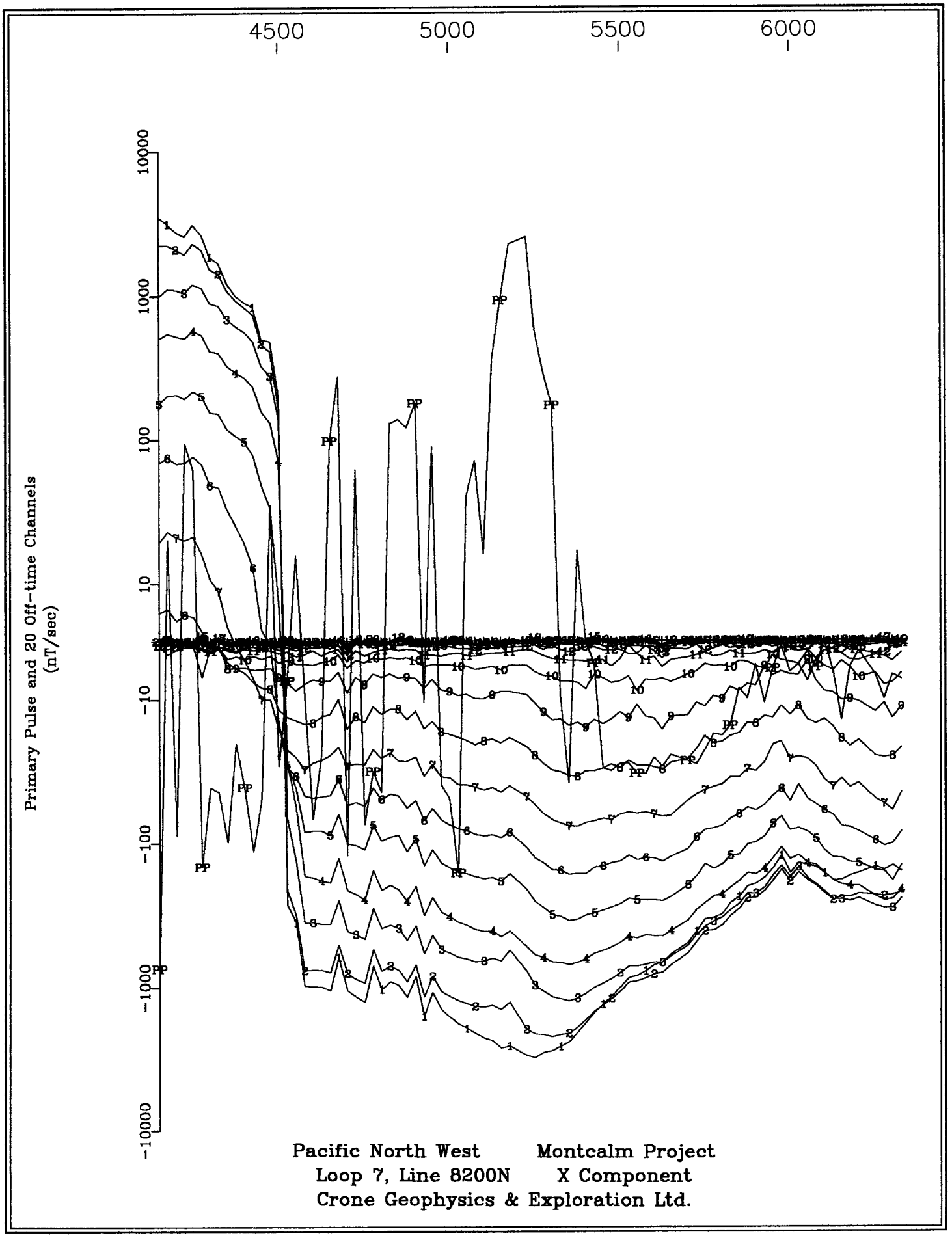
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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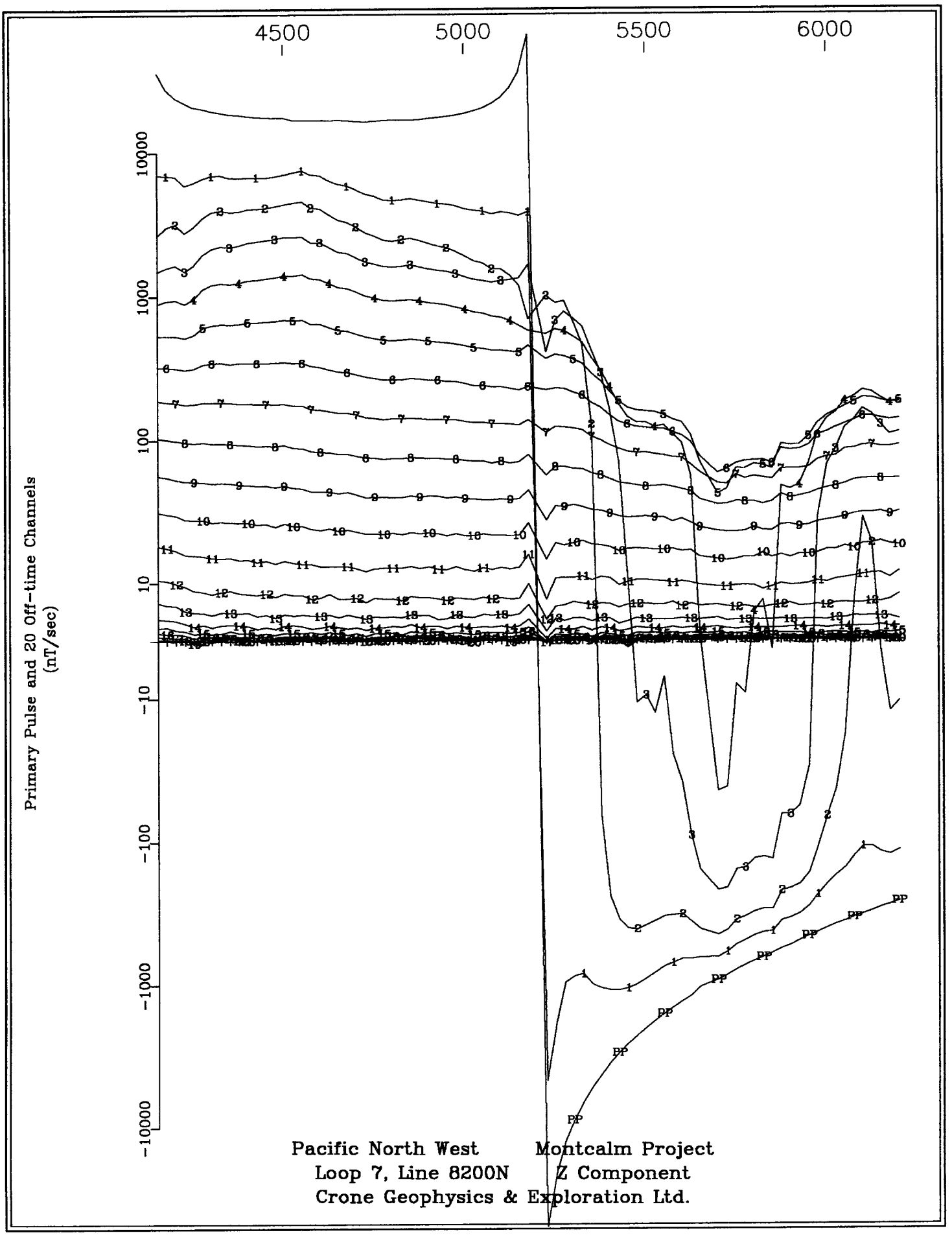
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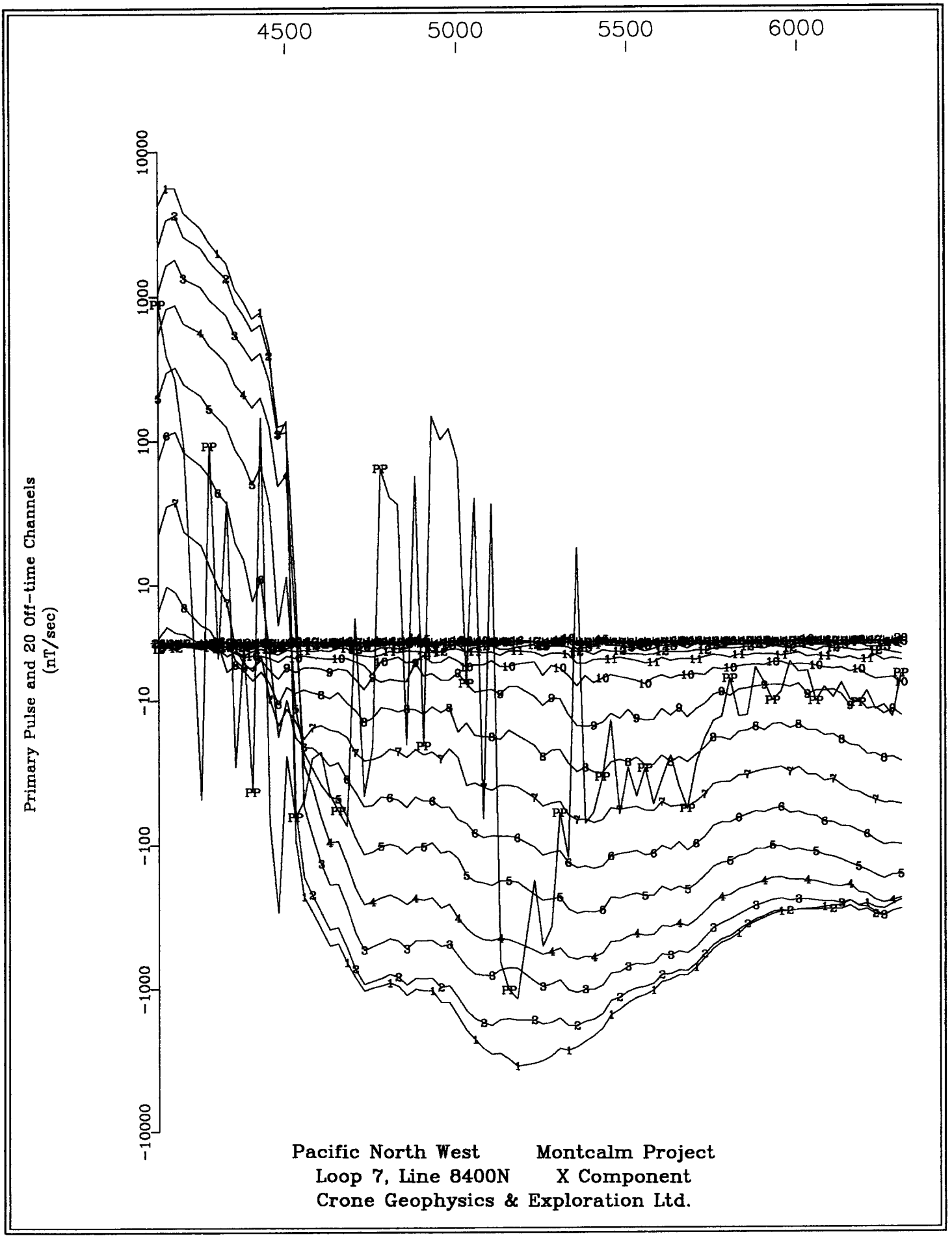
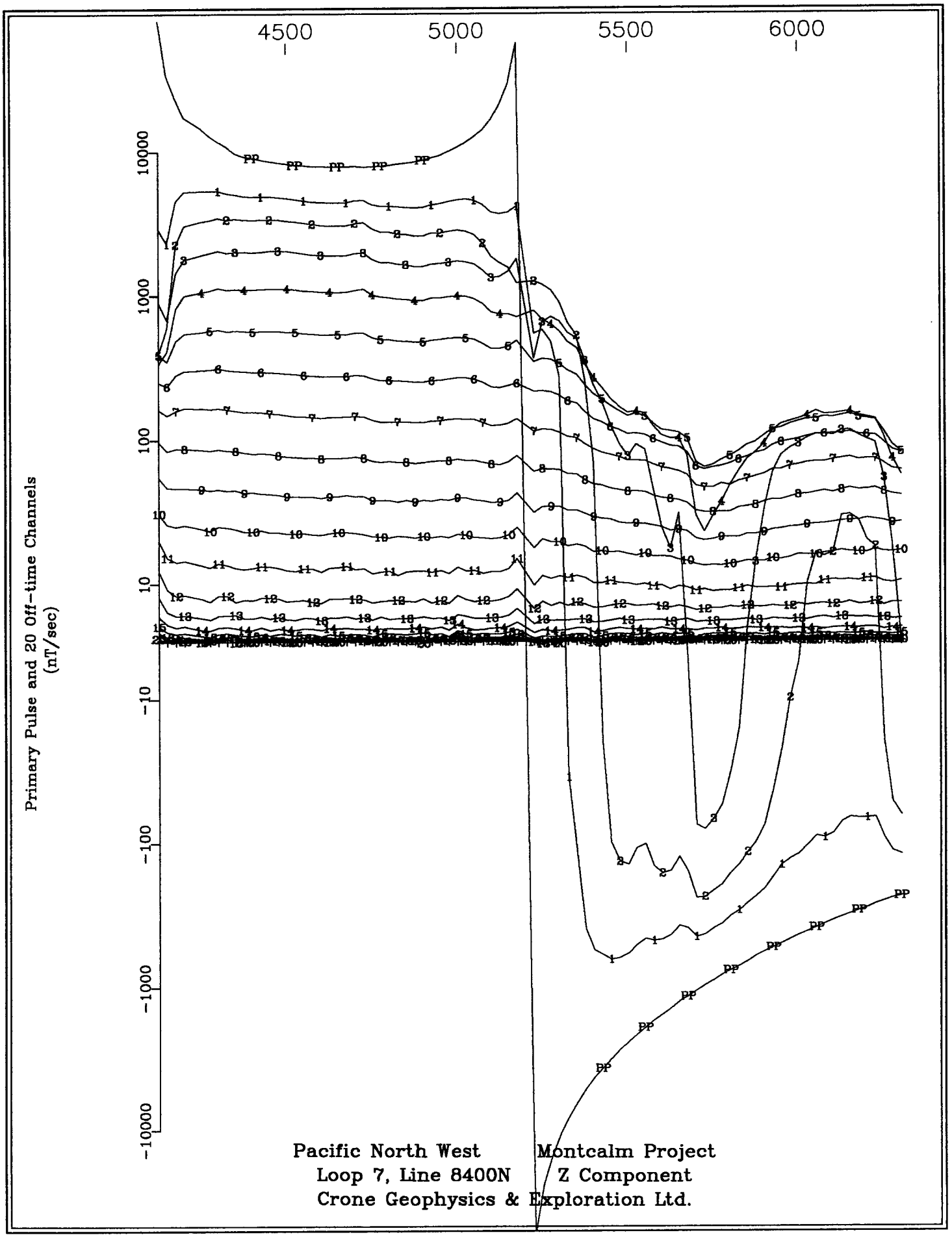
(nT/sec)
Pacific North West
Loop 7, Line 8200N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component



Pacific North West Montcalm Project
Loop 7, Line 8400N X Component
Crone Geophysics & Exploration Ltd.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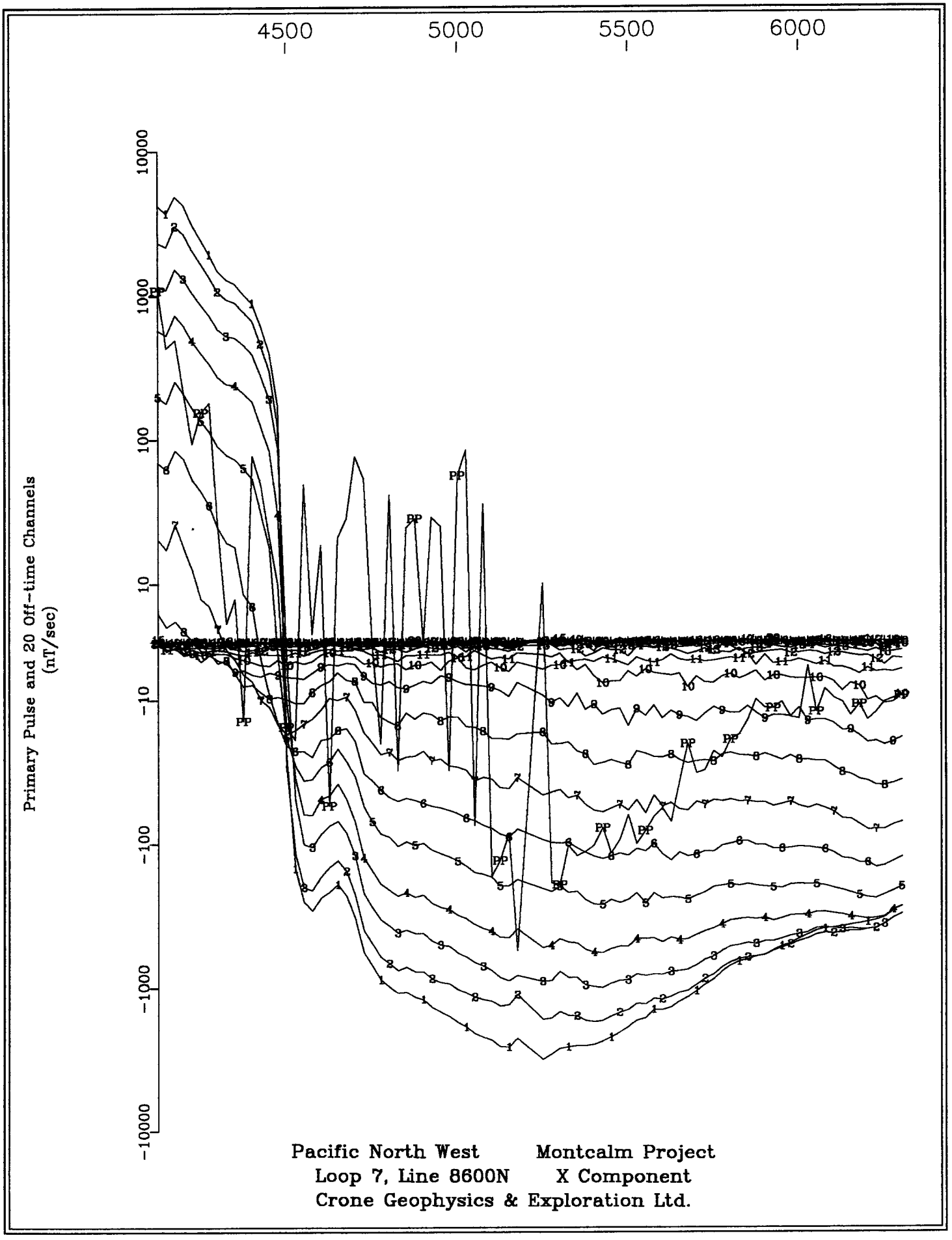
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 7, Line 8400N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component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-1000
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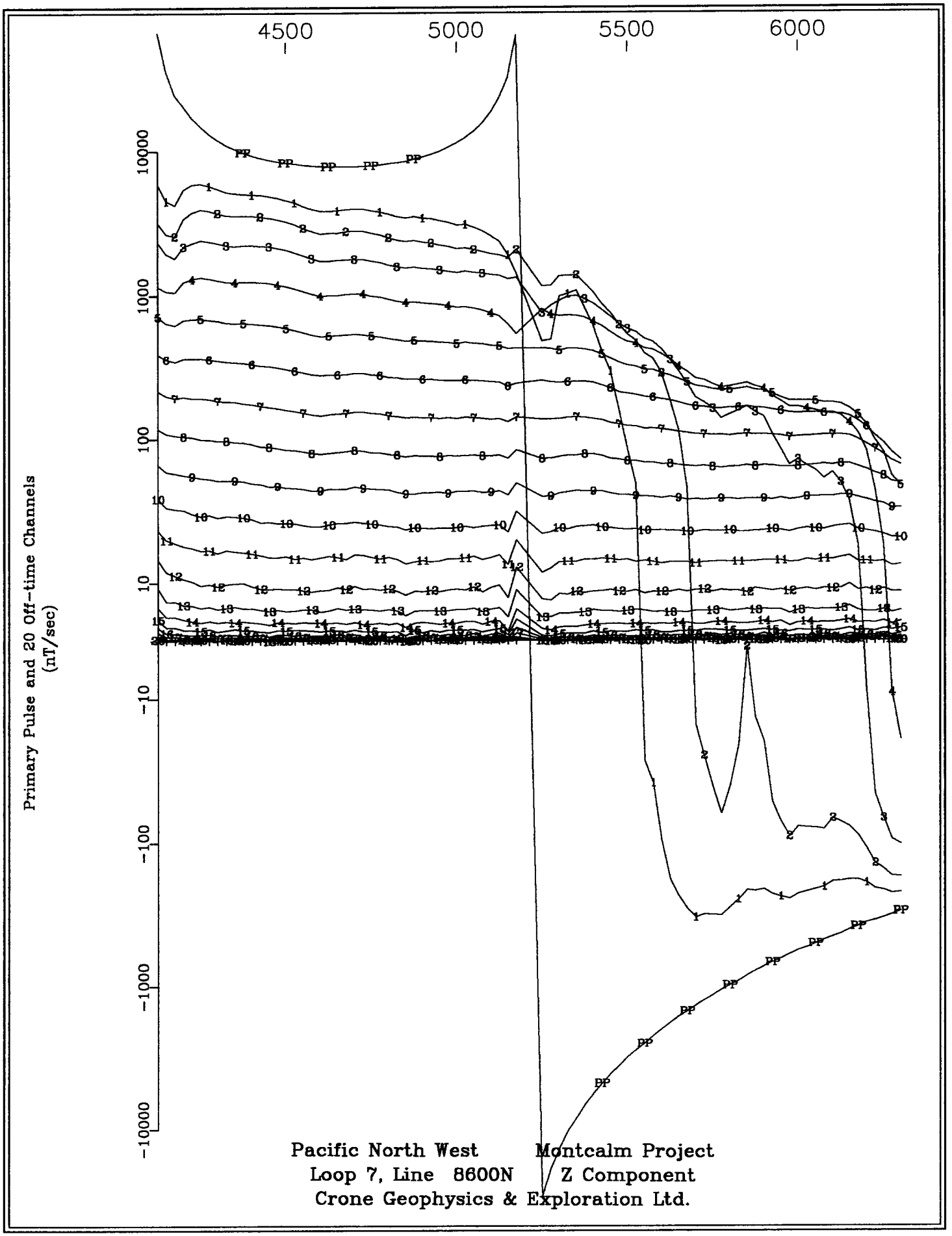
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 7, Line 8600N
Crone Geophysics & Exploration Ltd.
Montcalm Project
X Component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-1000
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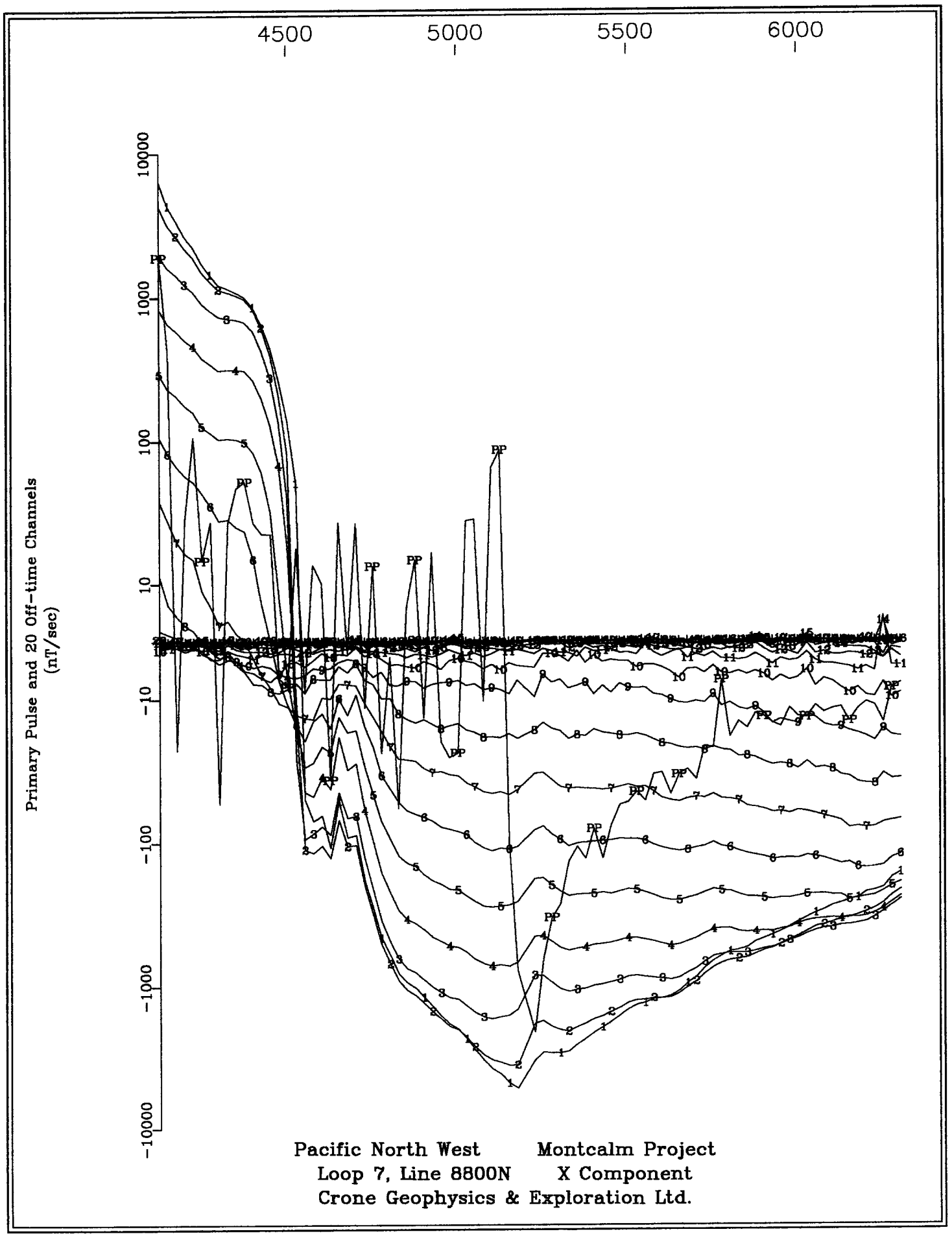
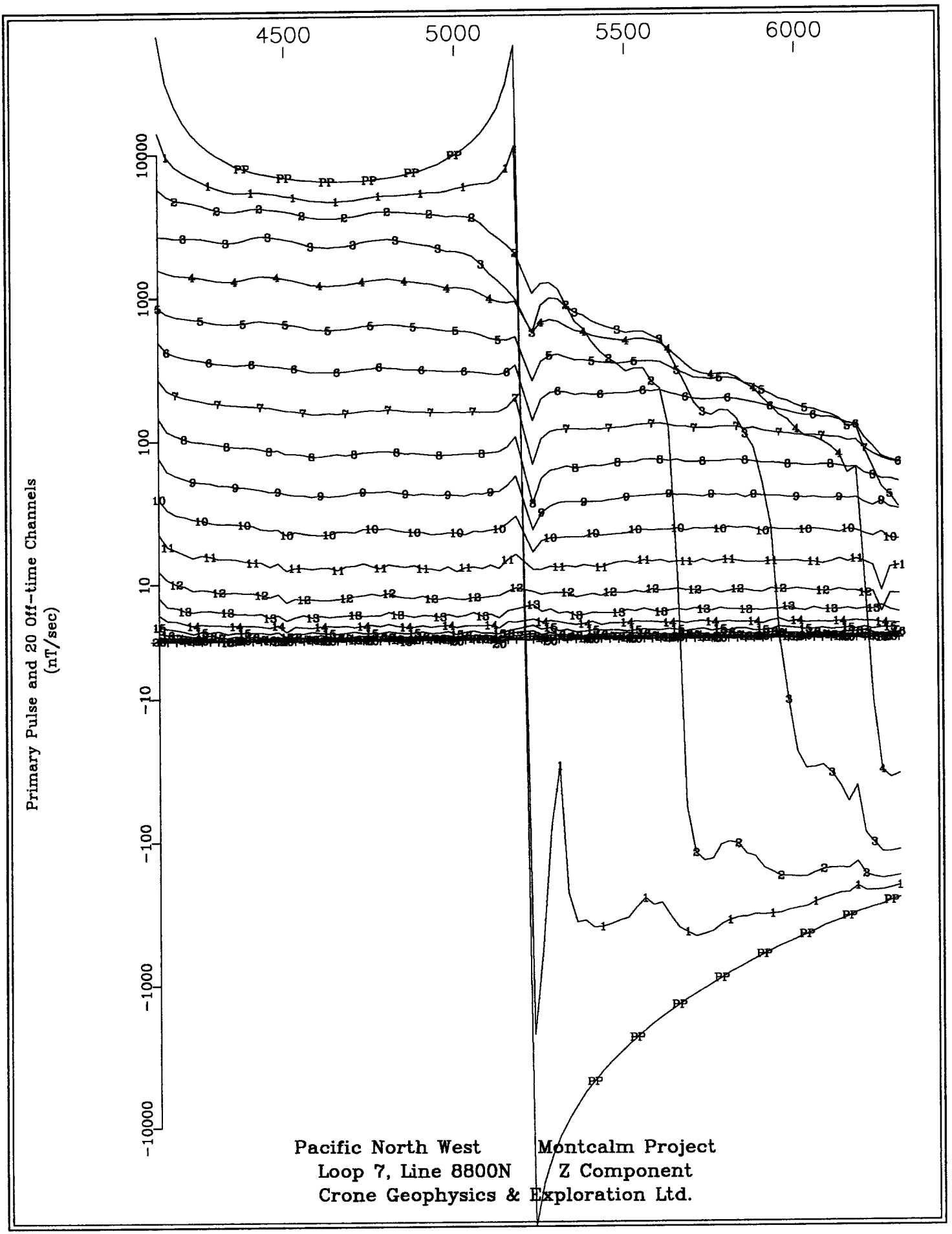
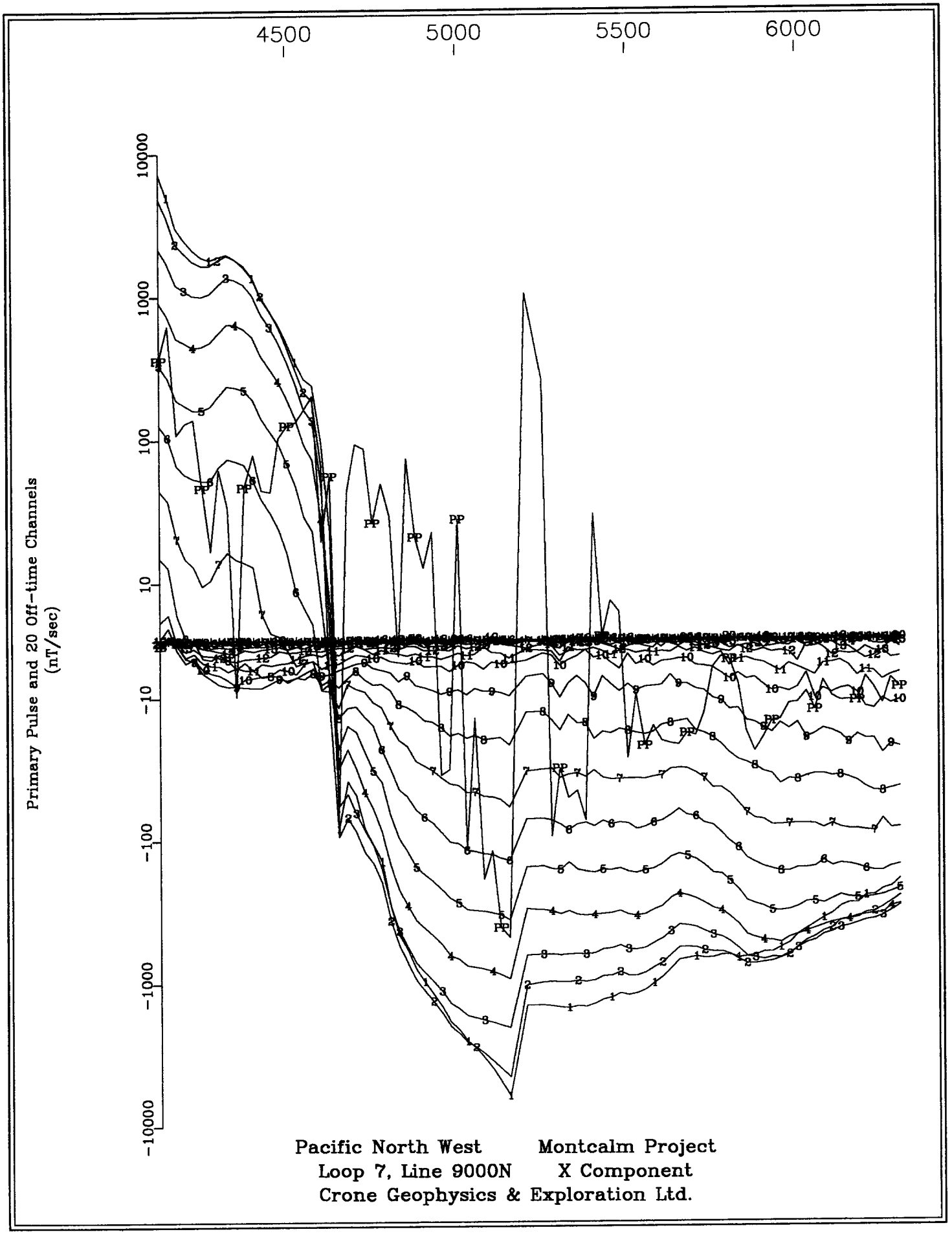
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 7, Line 8600N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component

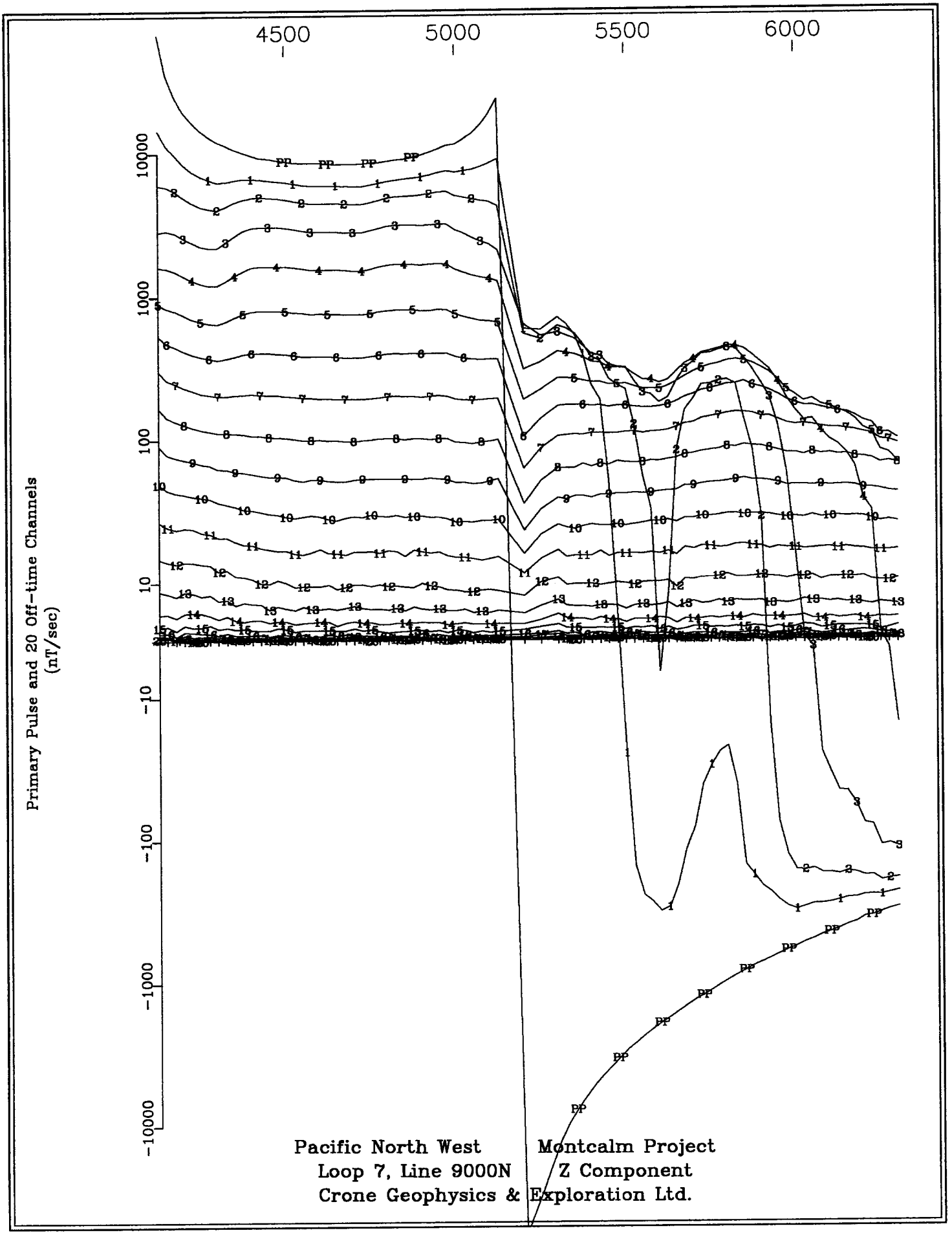


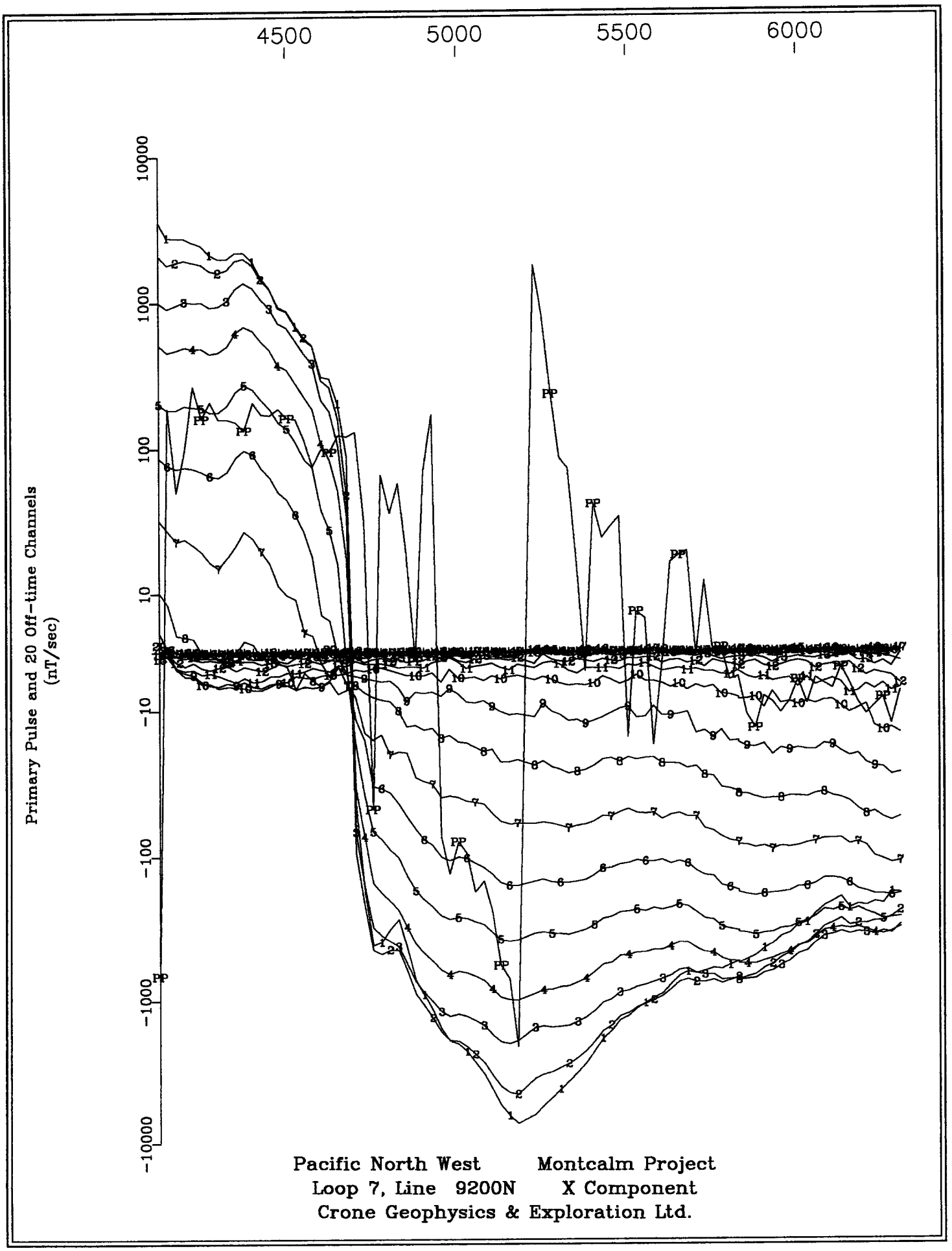
Pacific North West Montcalm Project
Loop 7, Line 8800N X Component
Crone Geophysics & Exploration Ltd.


4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 7, Line 8800N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component

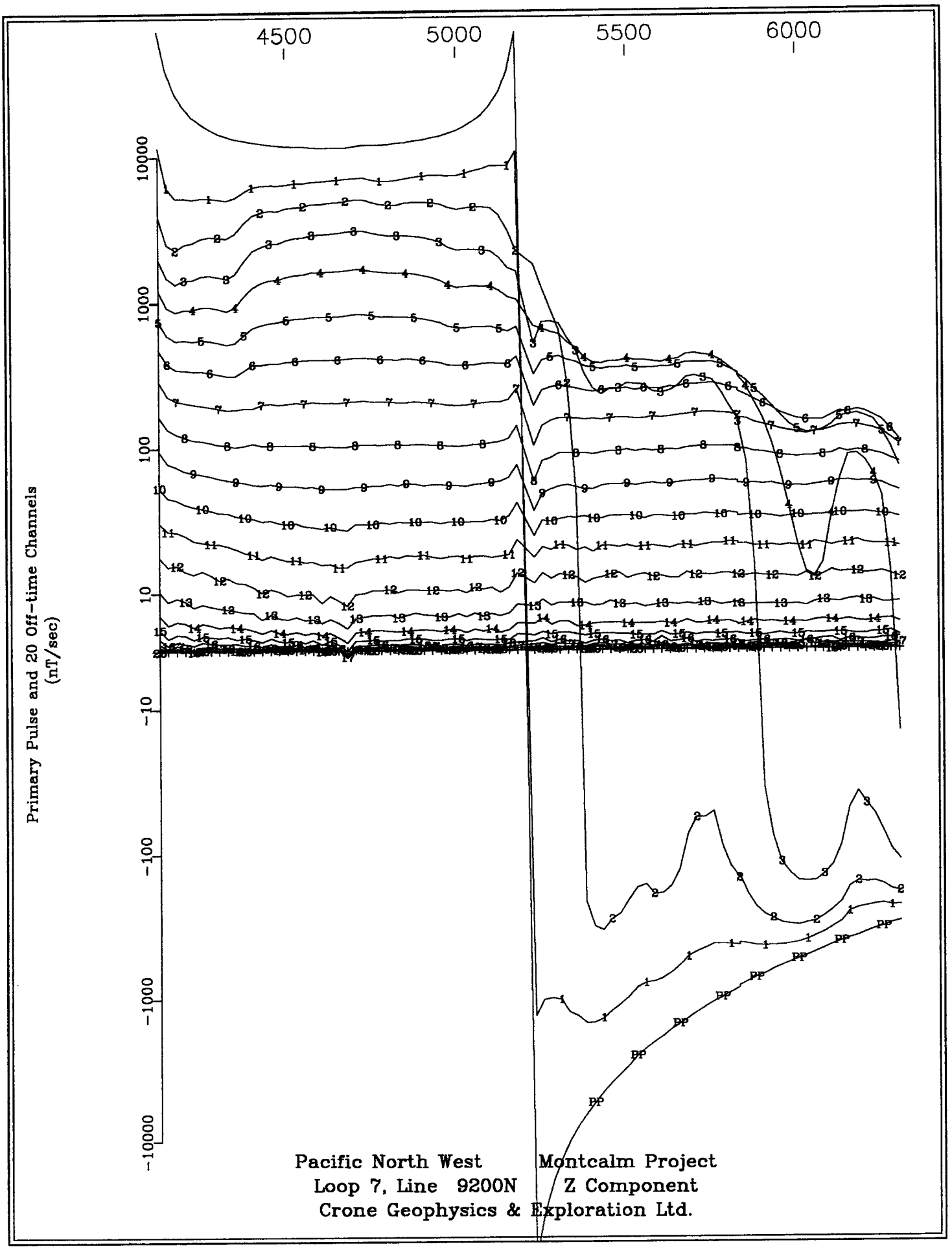


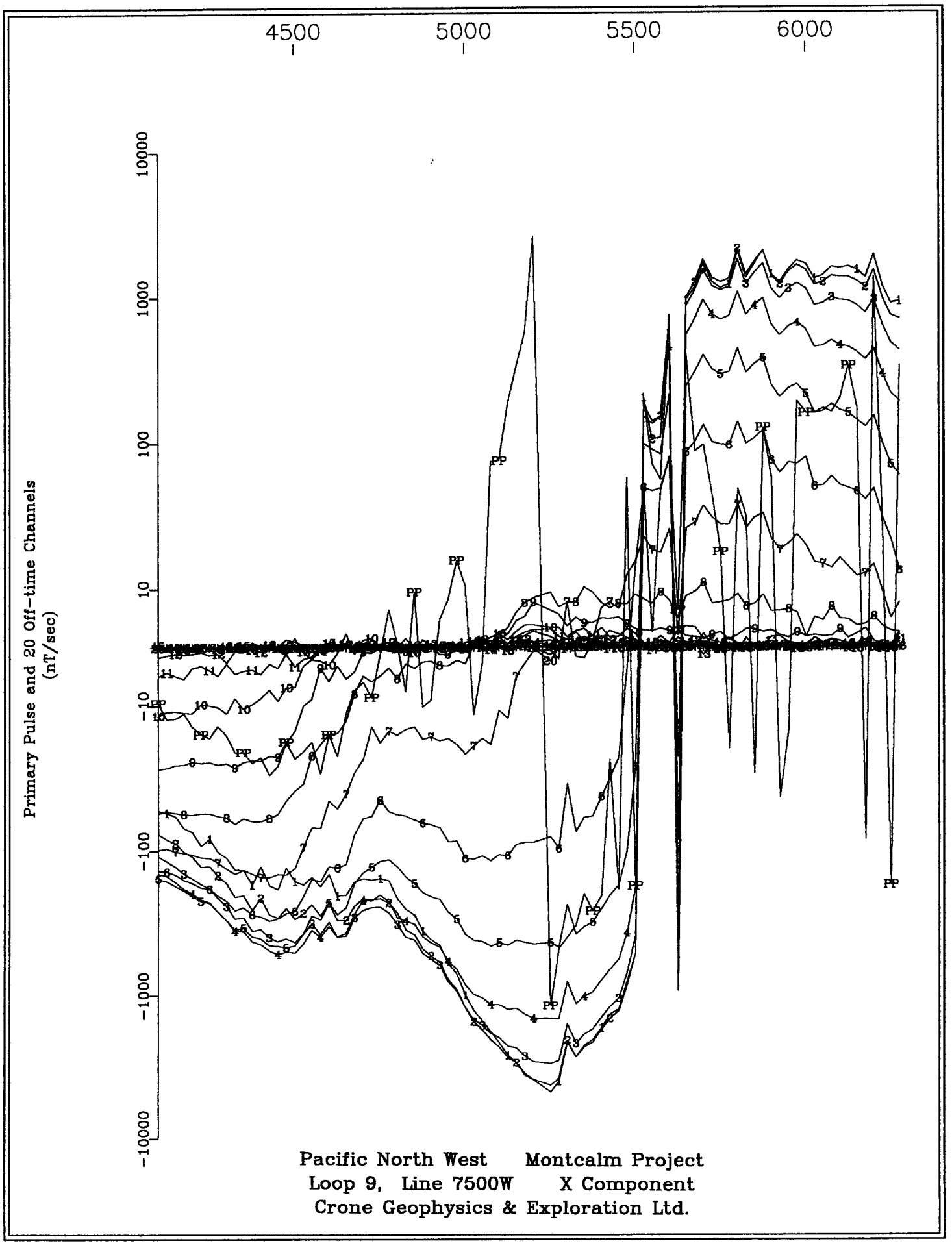
Pacific North West Montcalm Project
Loop 7, Line 9000N X Component
Crone Geophysics & Exploration Ltd.


4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 7, Line 9000N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component

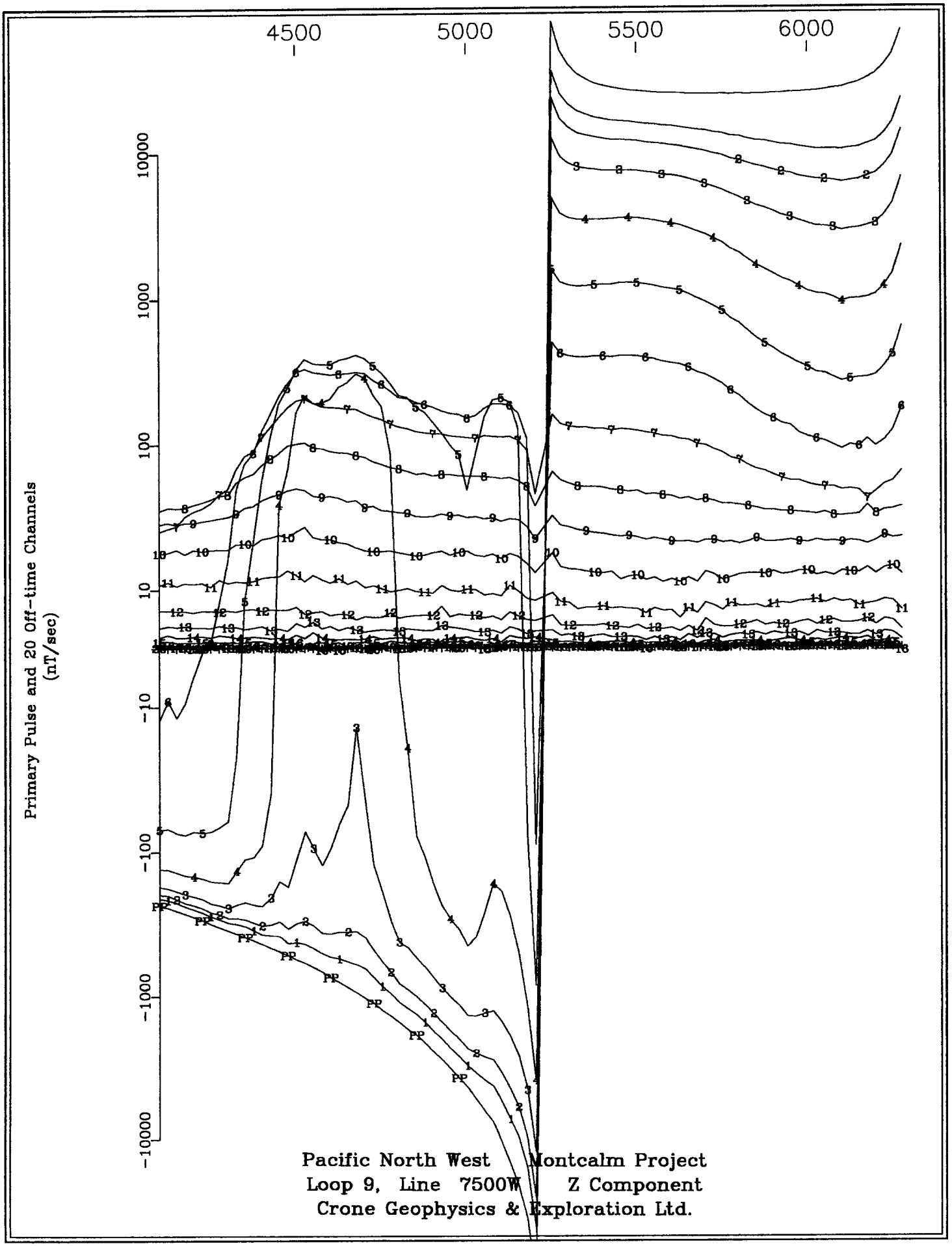


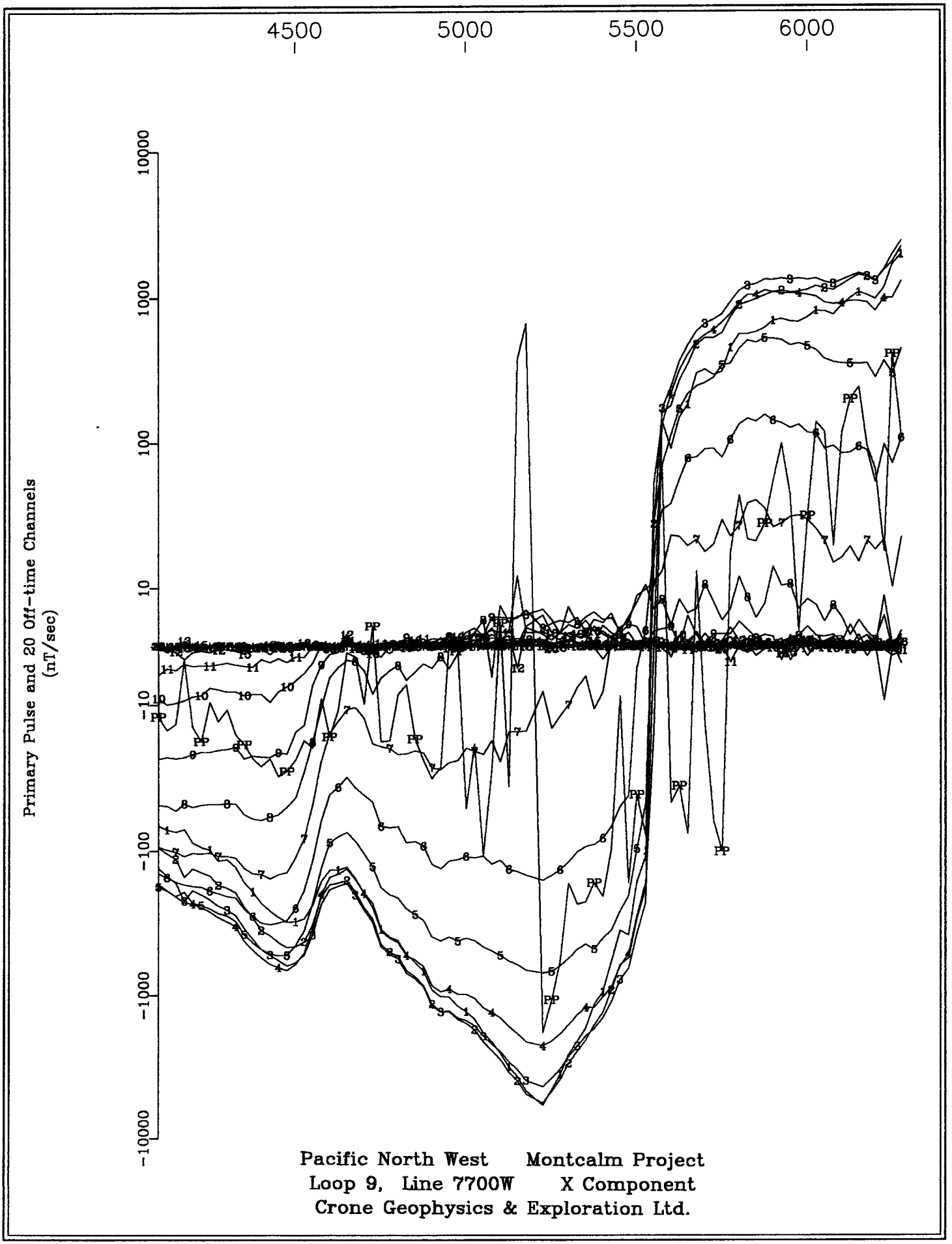
Pacific North West Montcalm Project
Loop 7, Line 9200N X Component
Crone Geophysics & Exploration Ltd.


4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 7, Line 9200N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component

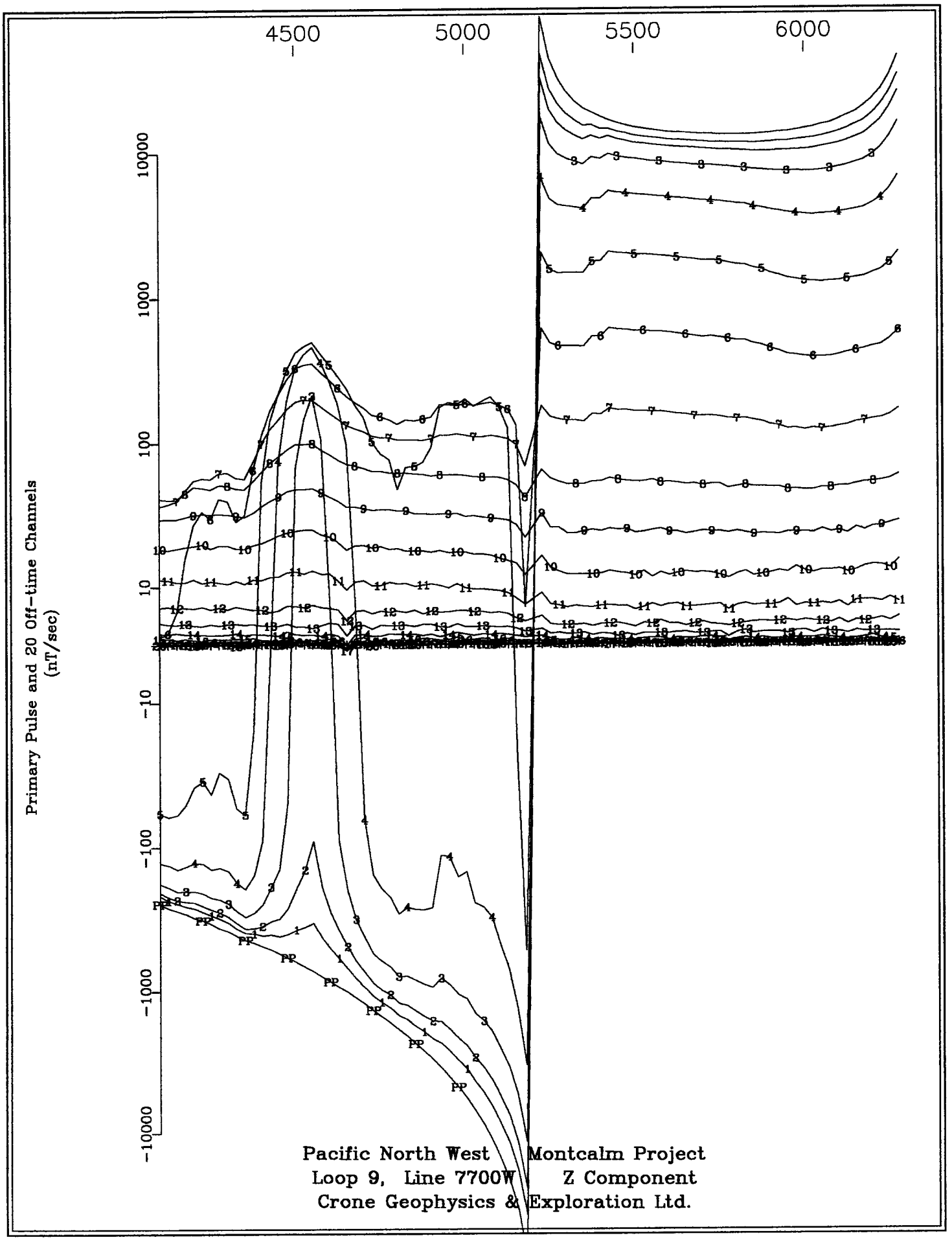


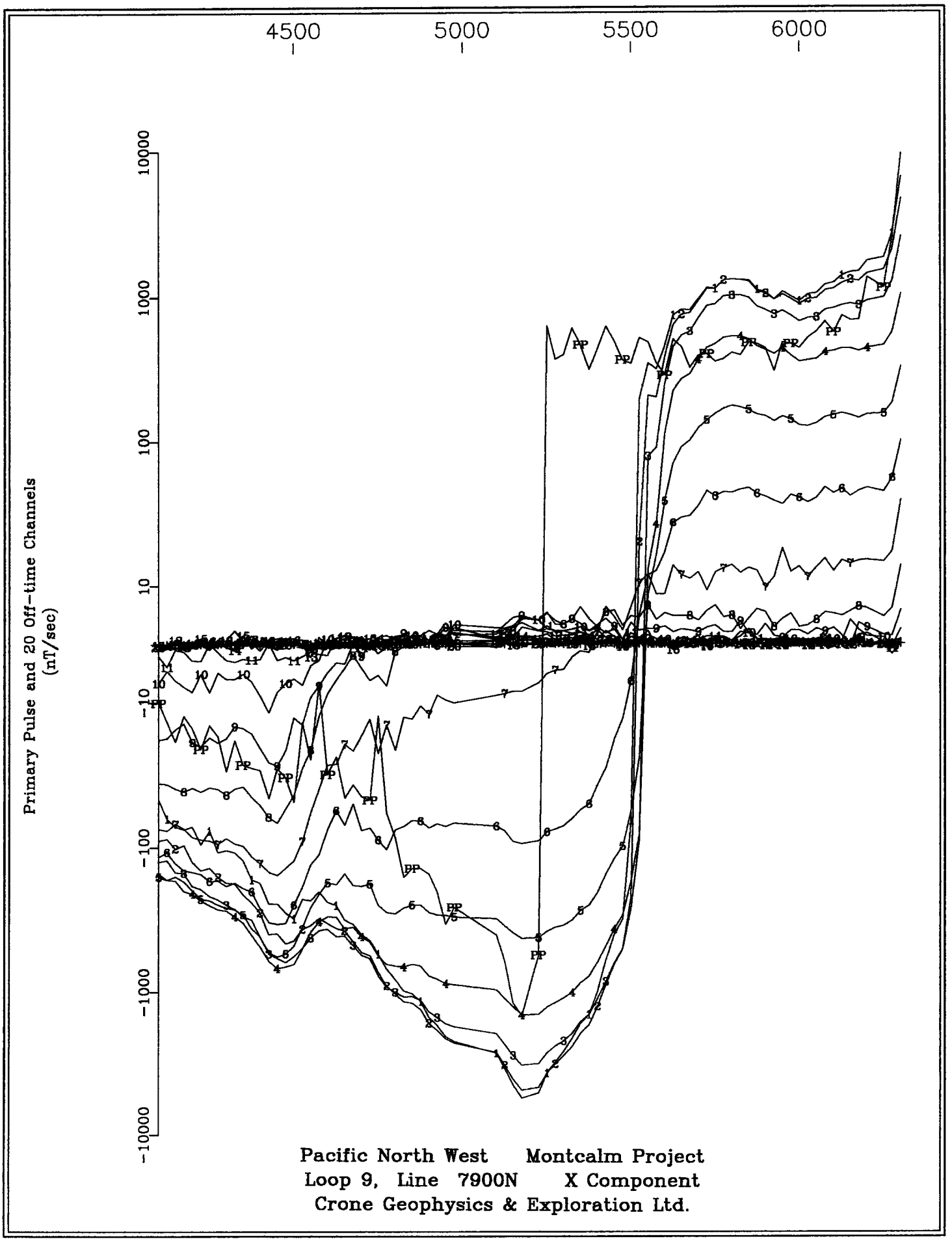
Pacific North West Montcalm Project
Loop 9, Line 7500W X Component
Crone Geophysics & Exploration Ltd.


4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West Montcalm Project
Loop 9, Line 7500W Z Component
Crone Geophysics & Exploration Ltd.

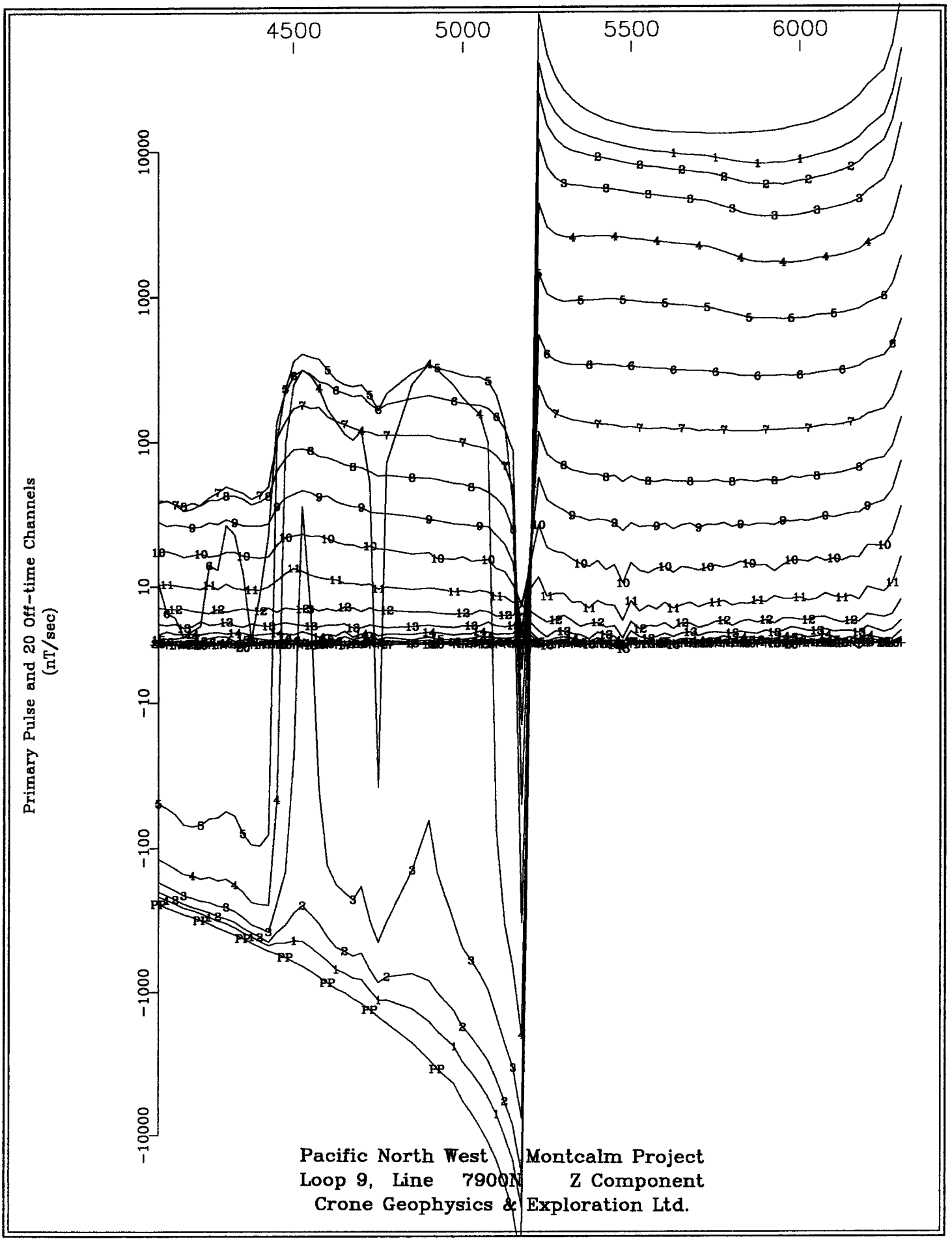


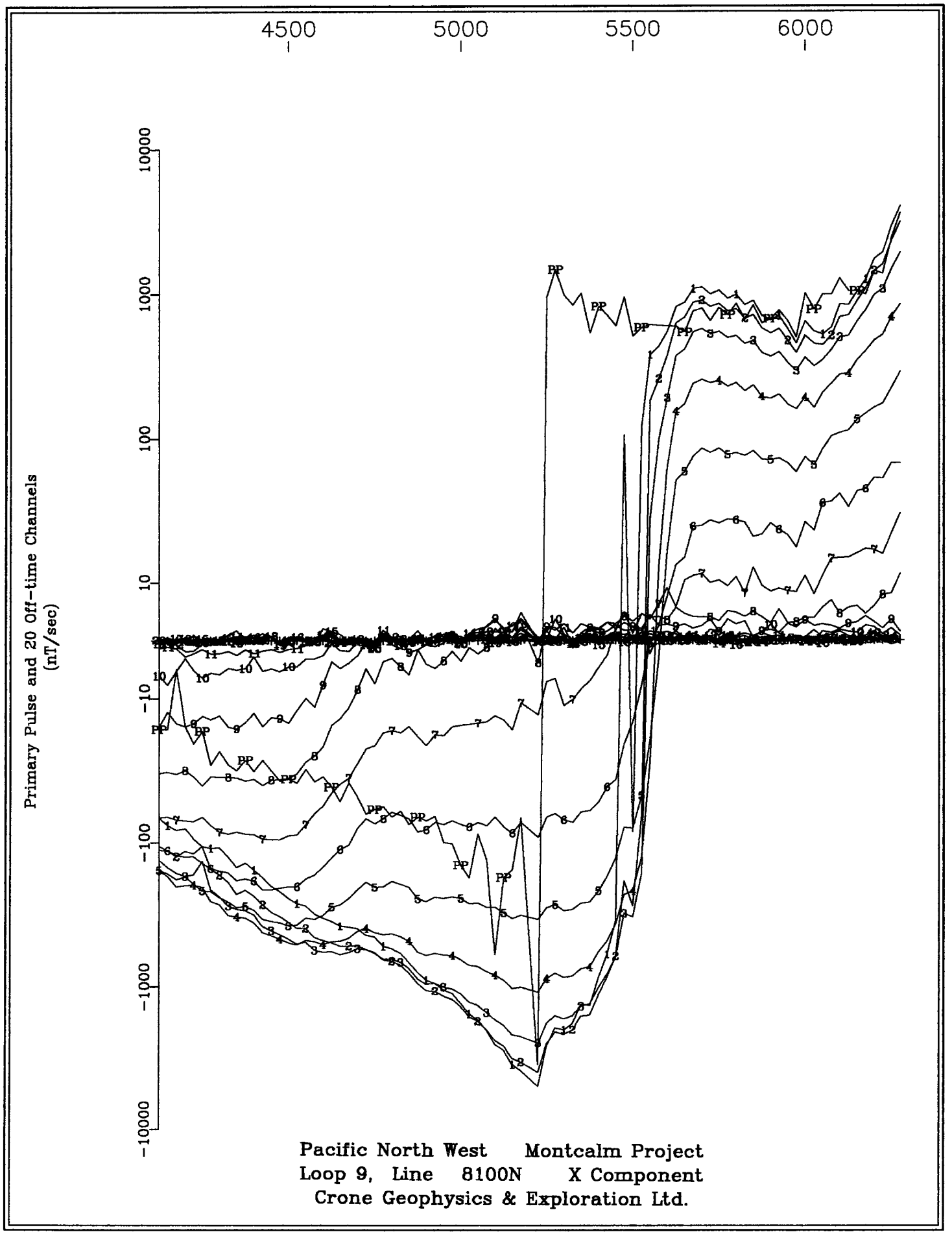
Pacific North West Montcalm Project
Loop 9, Line 7700W X Component
Crone Geophysics & Exploration Ltd.

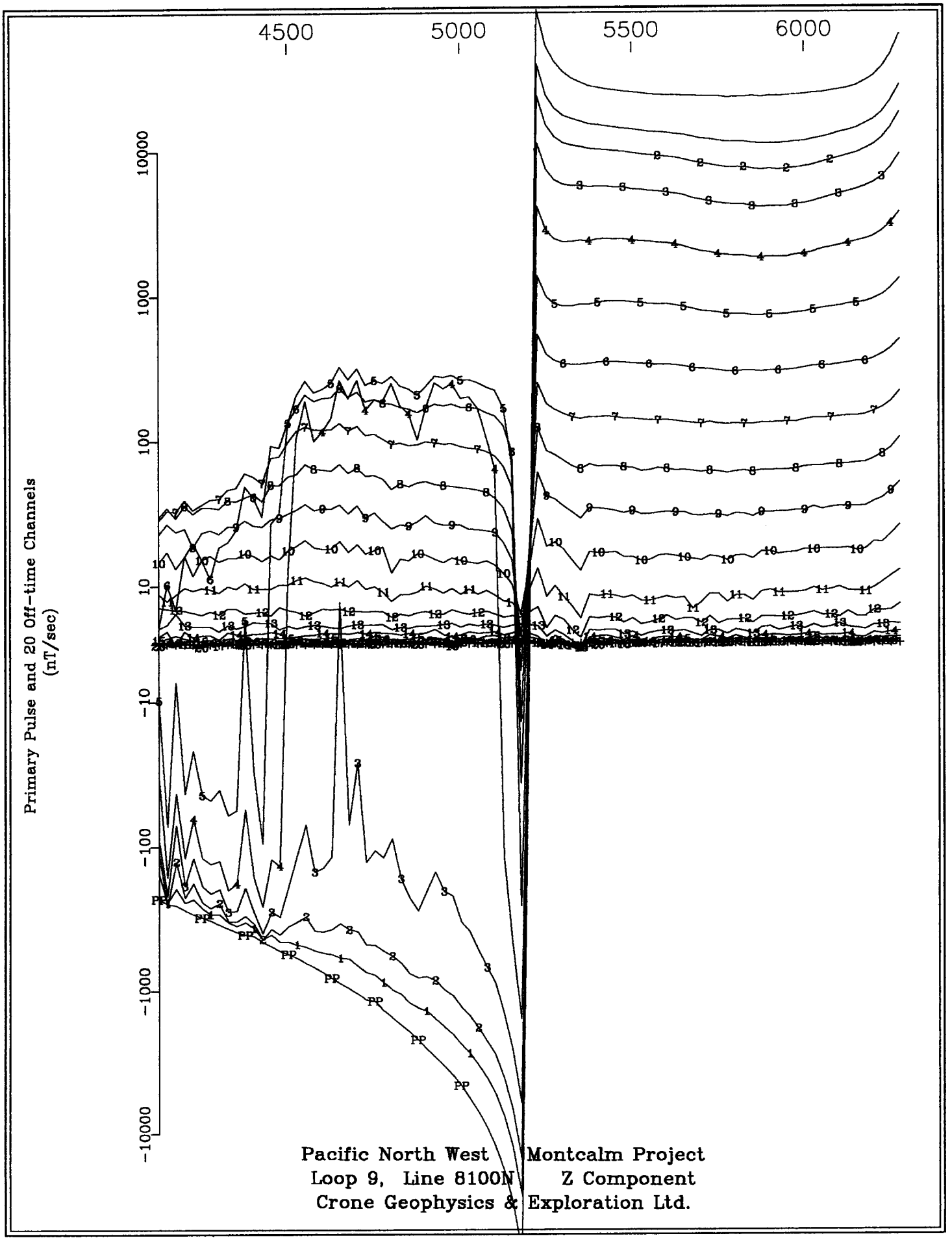

4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 9, Line 7700W
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component



Pacific North West Montcalm Project
Loop 9, Line 7900N X Component
Crone Geophysics & Exploration Ltd.

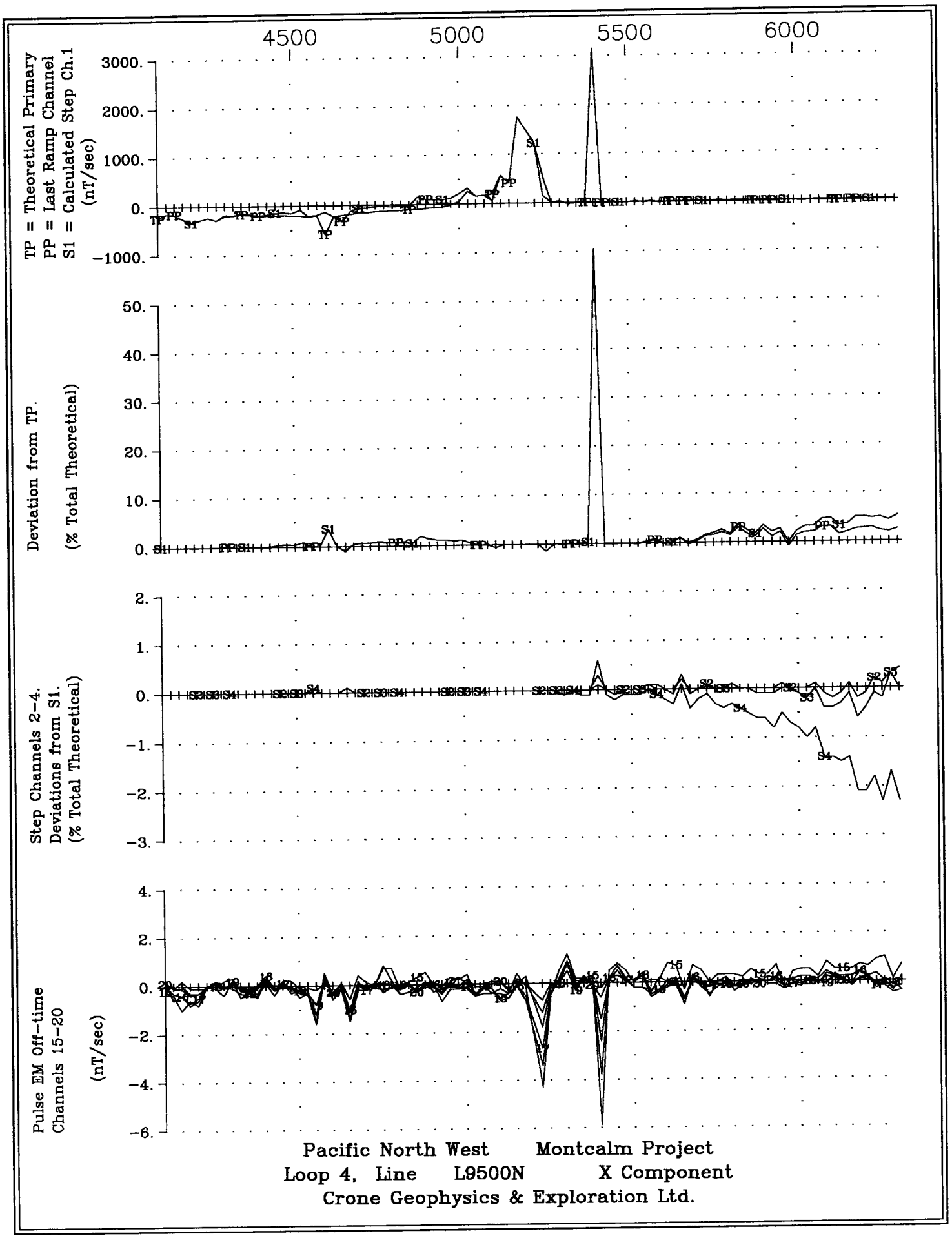

4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West Montcalm Project
Loop 9, Line 7900N Z Component
Crone Geophysics & Exploration Ltd.

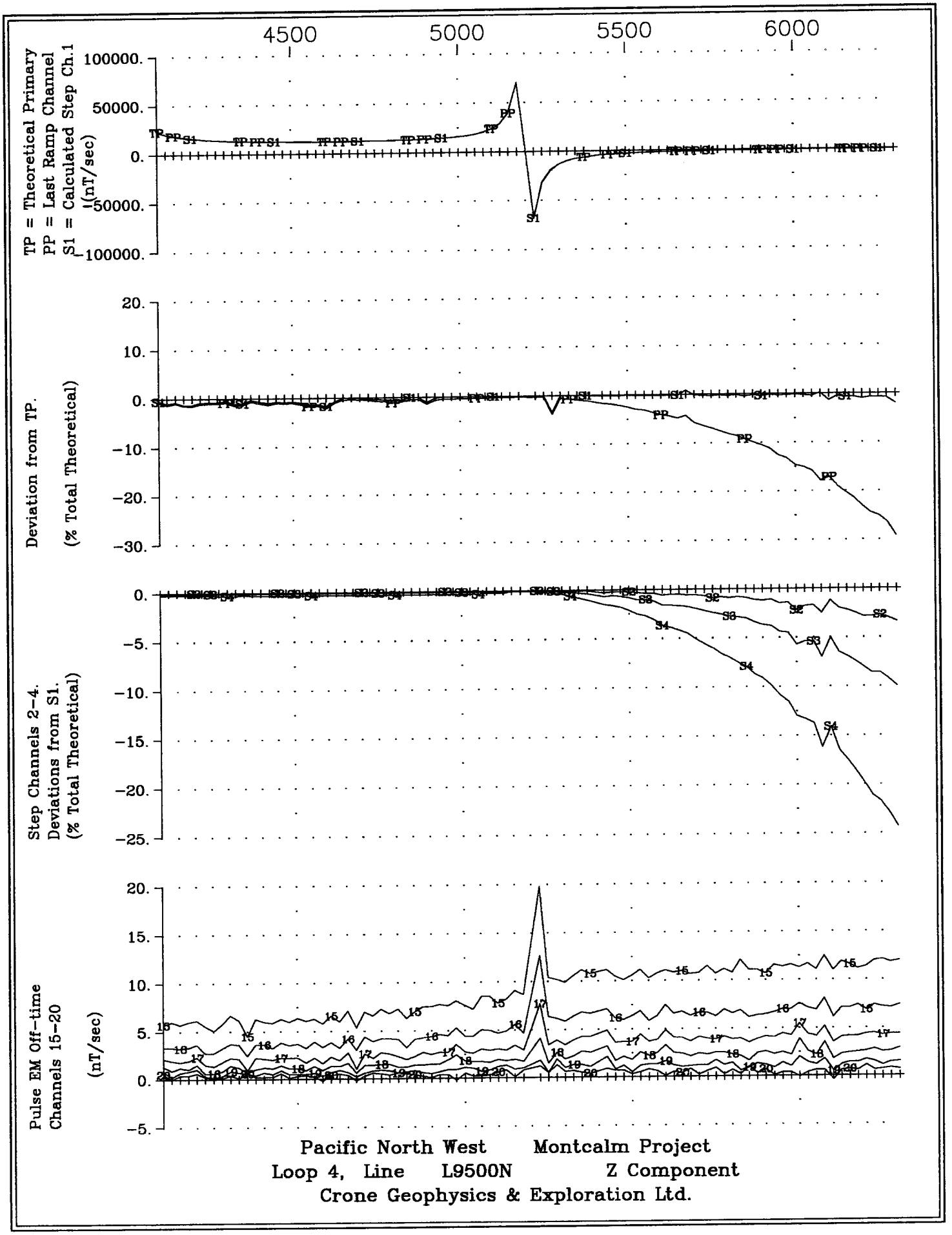

4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West Montcalm Project
Loop 9, Line 8100N X Component
Crone Geophysics & Exploration Ltd.


4500
5000
5500
6000
10000
1000
100
10
-10
-100
-1000
-10000
Primary Pulse and 20 Off-time Channels
(nT/sec)
Pacific North West
Loop 9, Line 8100N
Crone Geophysics & Exploration Ltd.
Montcalm Project
Z Component

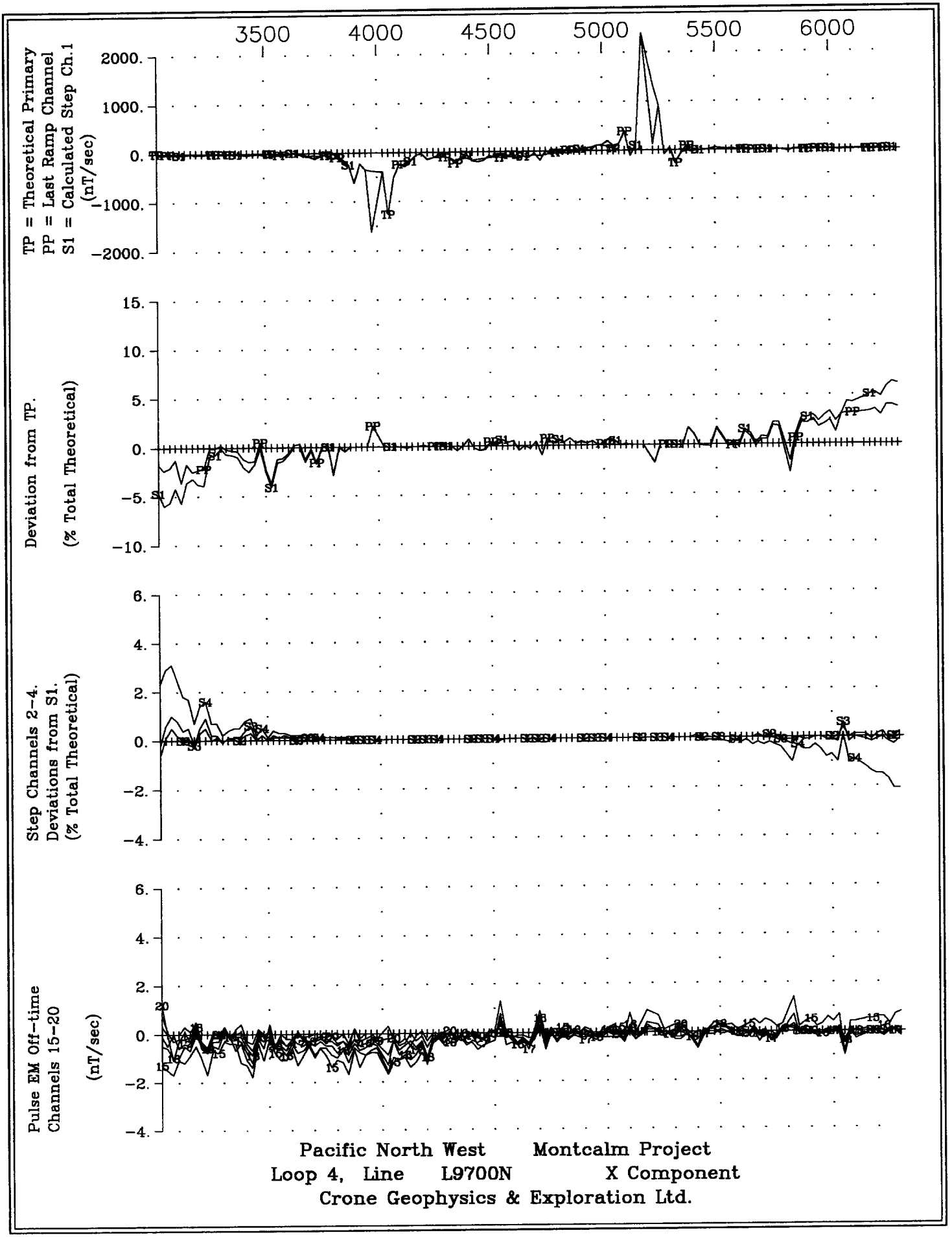
APPENDIX IV

STEP RESPONSE DATA PROFILES

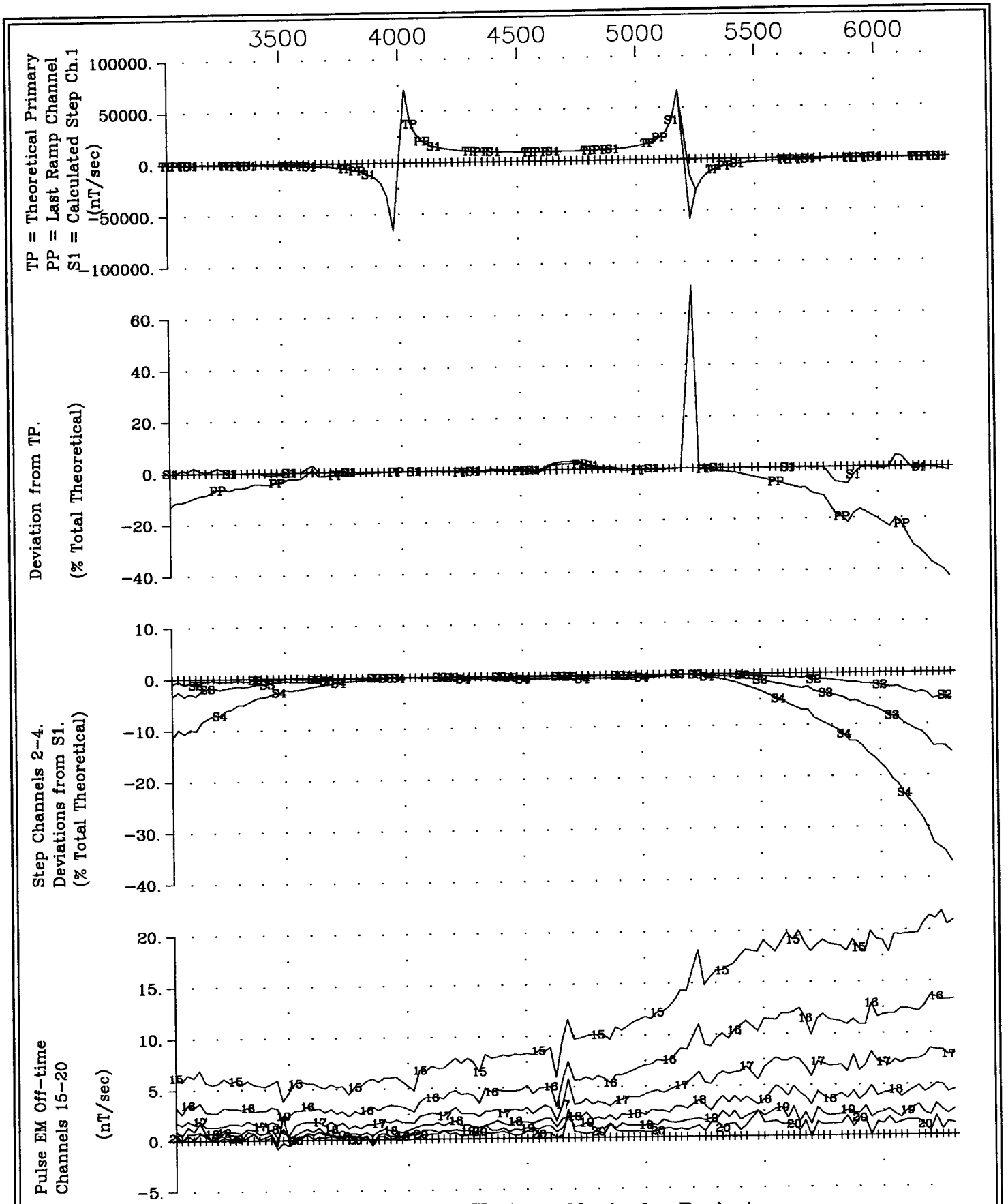

4500
5000
5500
6000
TP = Theoretical Primary
PP = Last Ramp Channel
S1 = Calculated Step Ch.1
(nT/sec)
3000.
2000.
1000.
0.
-1000.
Deviation from TP.
(% Total Theoretical)
50.
40.
30.
20.
10.
0.
Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
2.
1.
0.
-1.
-2.
-3.
Pulse EM Off-time
Channels 15-20
(nT/sec)
4.
2.
0.
-2.
-4.
-6.
Pacific North West Montcalm Project
Loop 4, Line L9500N X Component
Crone Geophysics & Exploration Ltd.



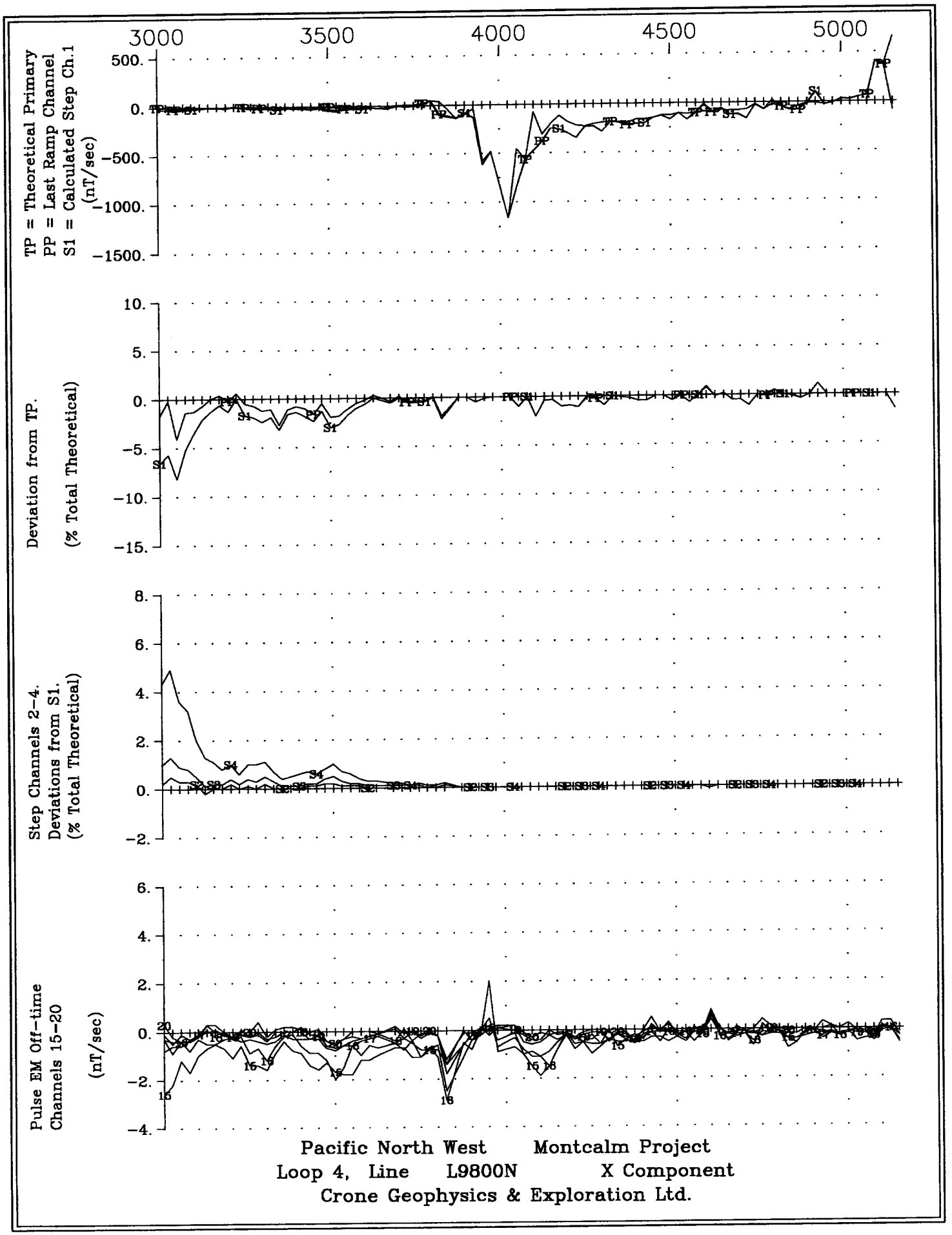
Pacific North West Montcalm Project
Loop 4, Line L9500N Z Component
Crone Geophysics & Exploration Ltd.



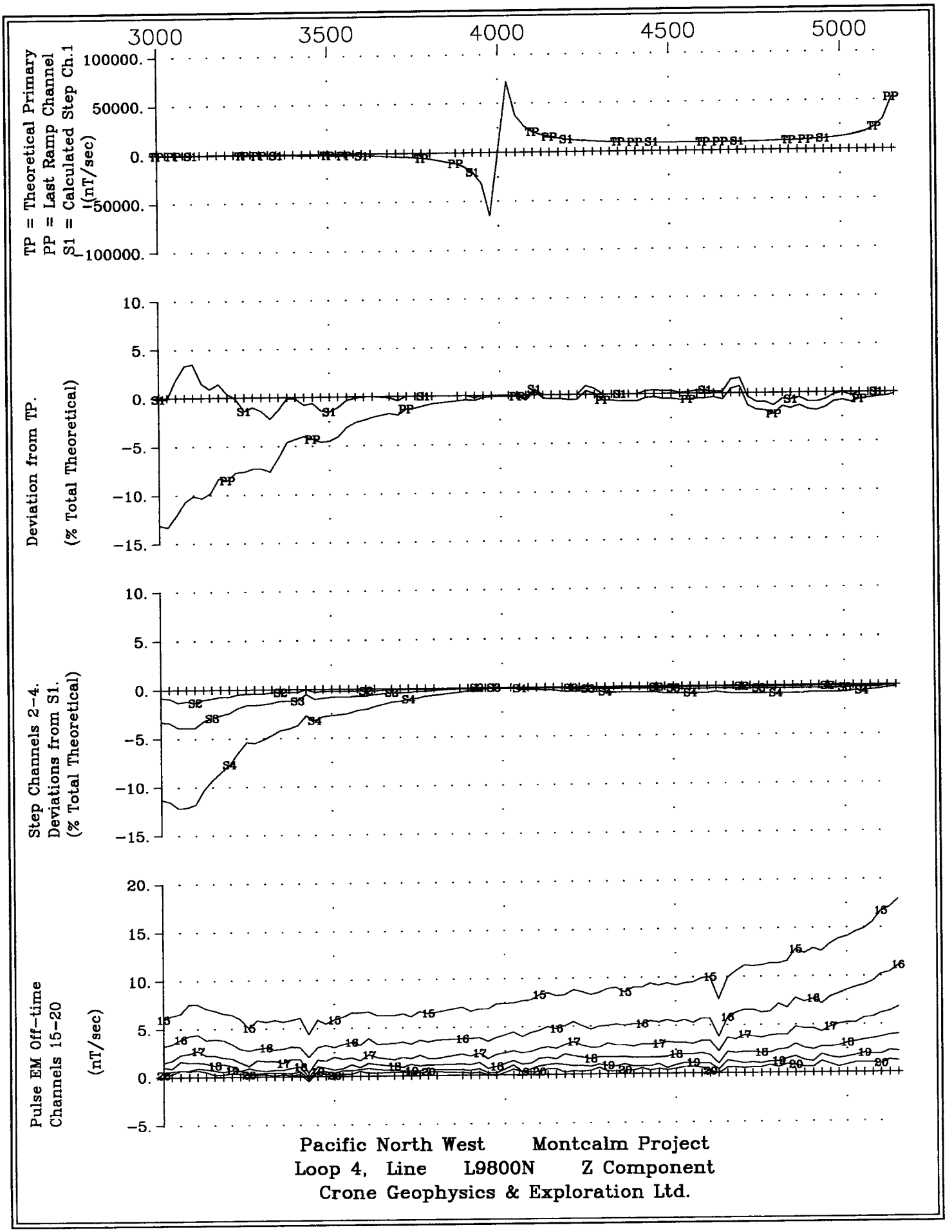
Pacific North West Montcalm Project
Loop 4, Line L9700N X Component
Crone Geophysics & Exploration Ltd.



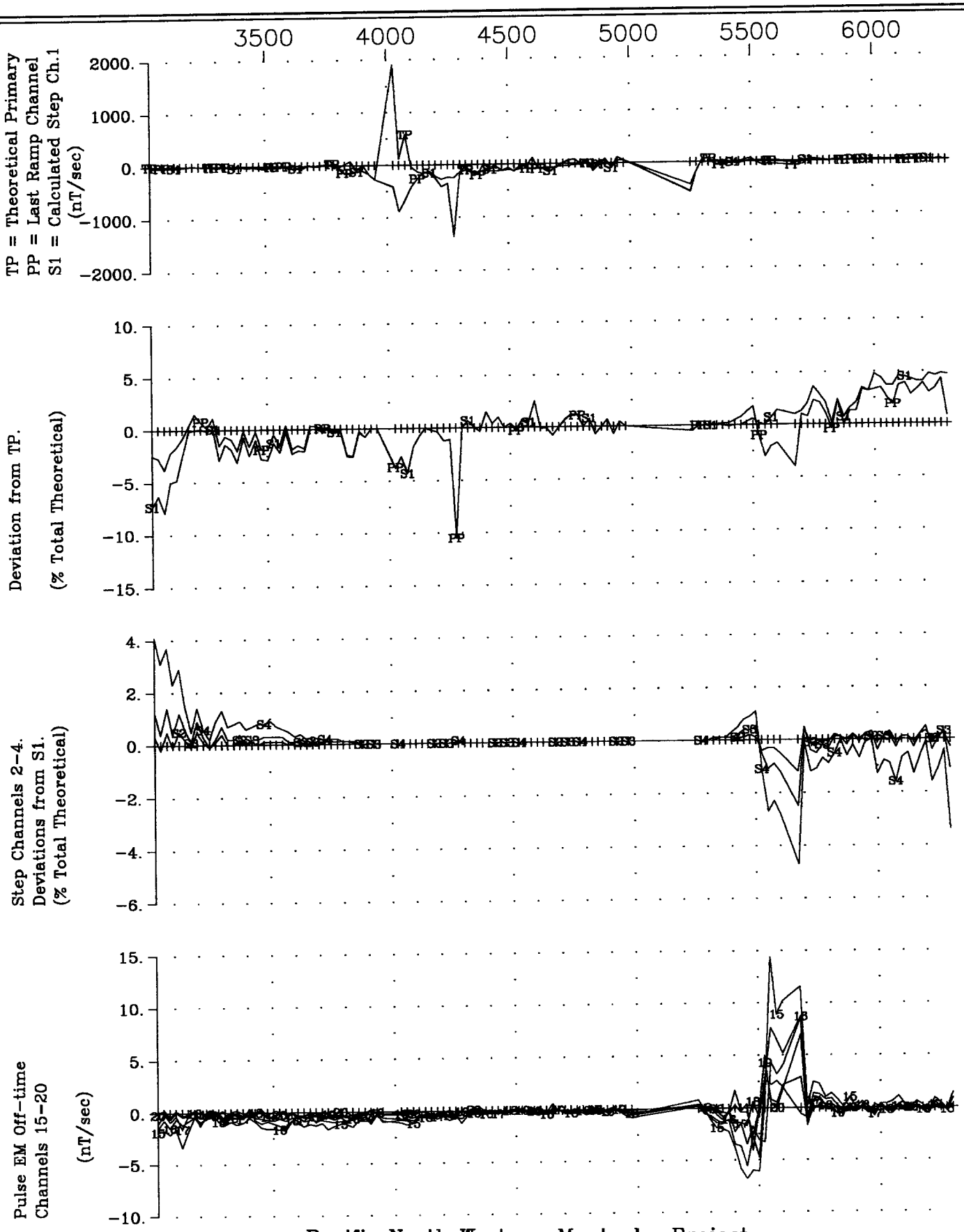
Pacific North West Montcalm Project
Loop 4, Line L9700N Z Component
Crone Geophysics & Exploration Ltd.



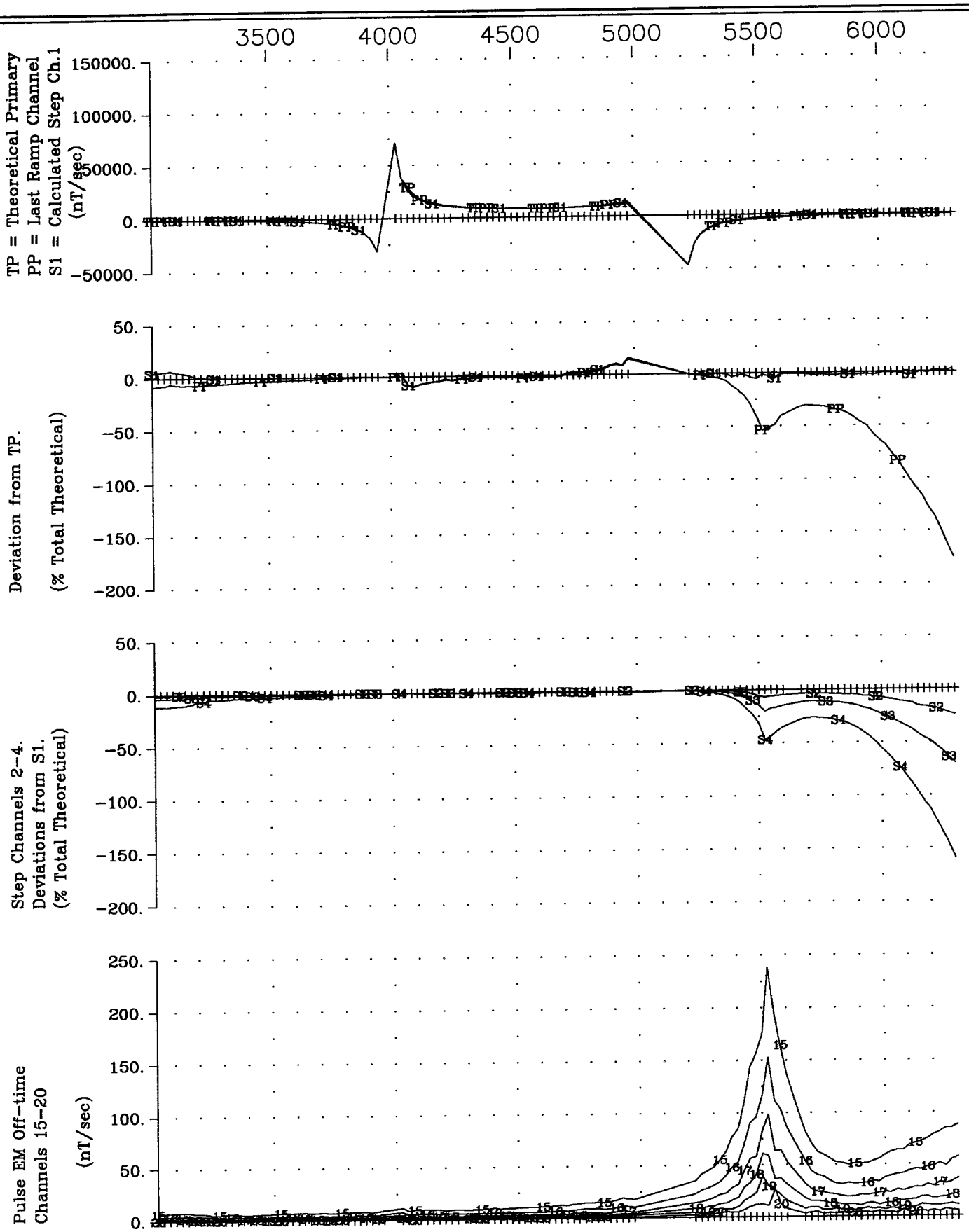
Pacific North West Montcalm Project
Loop 4, Line L9800N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line L9800N Z Component
Crone Geophysics & Exploration Ltd.



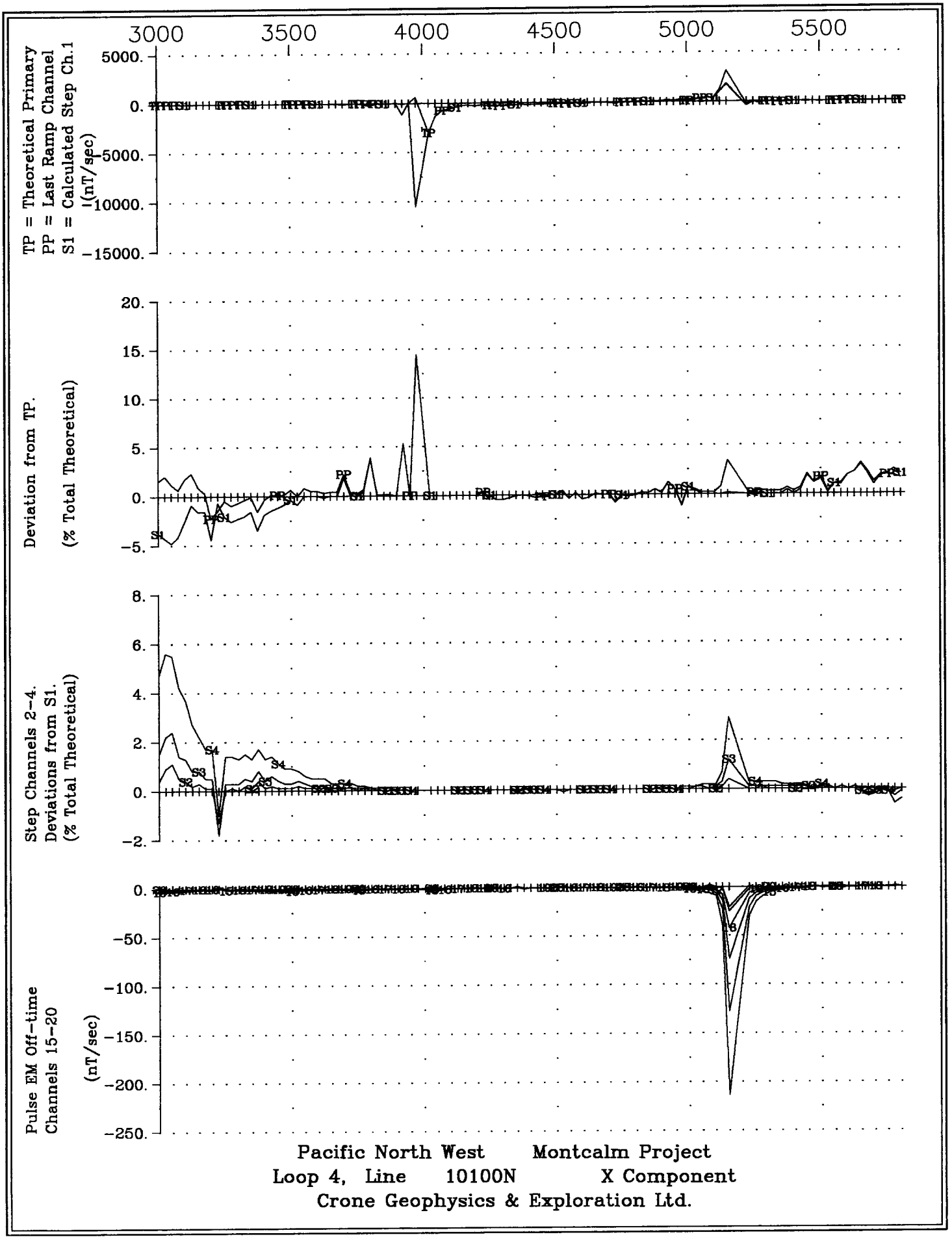
Pacific North West Montcalm Project
Loop 4, Line L9900N X Component
Crone Geophysics & Exploration Ltd.

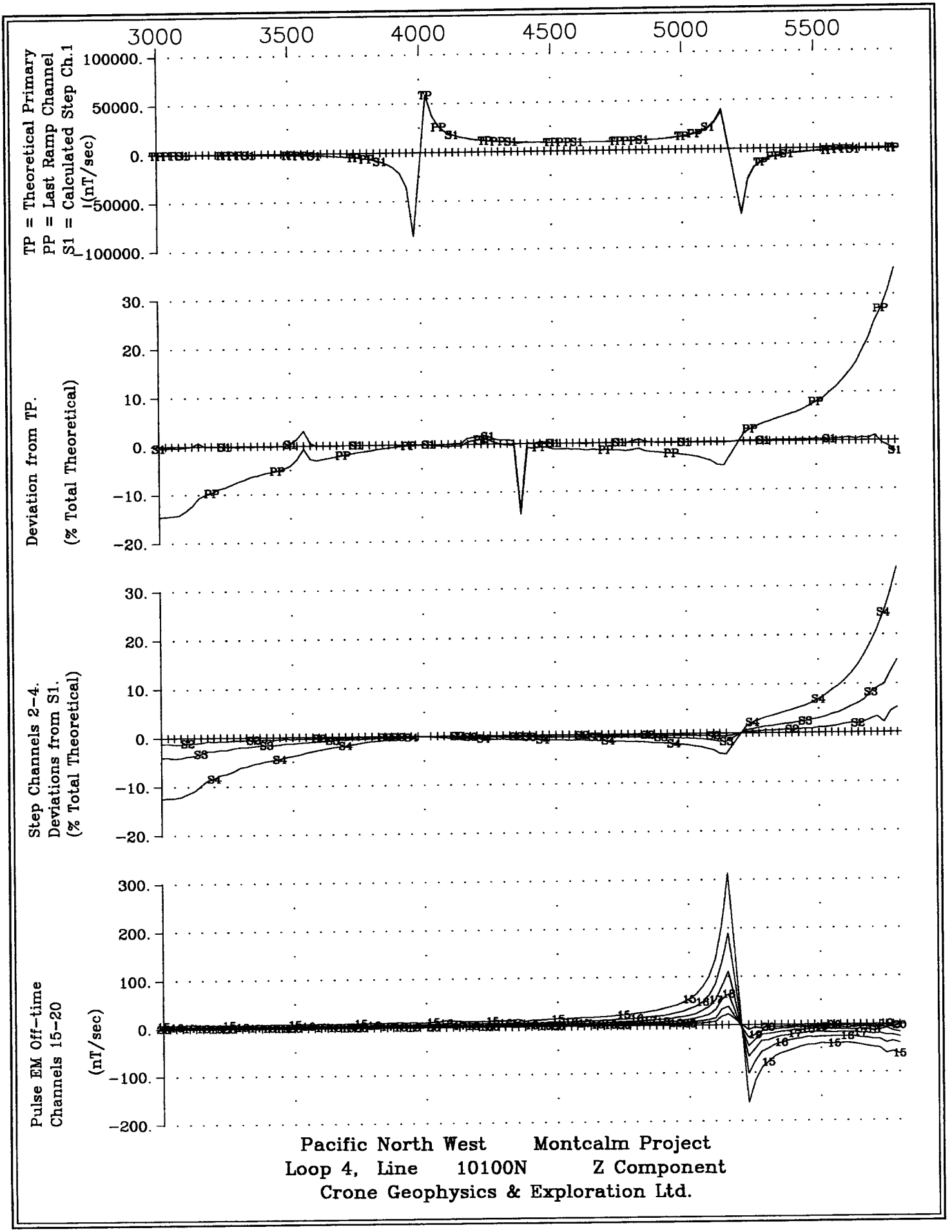


Pacific North West Montcalm Project

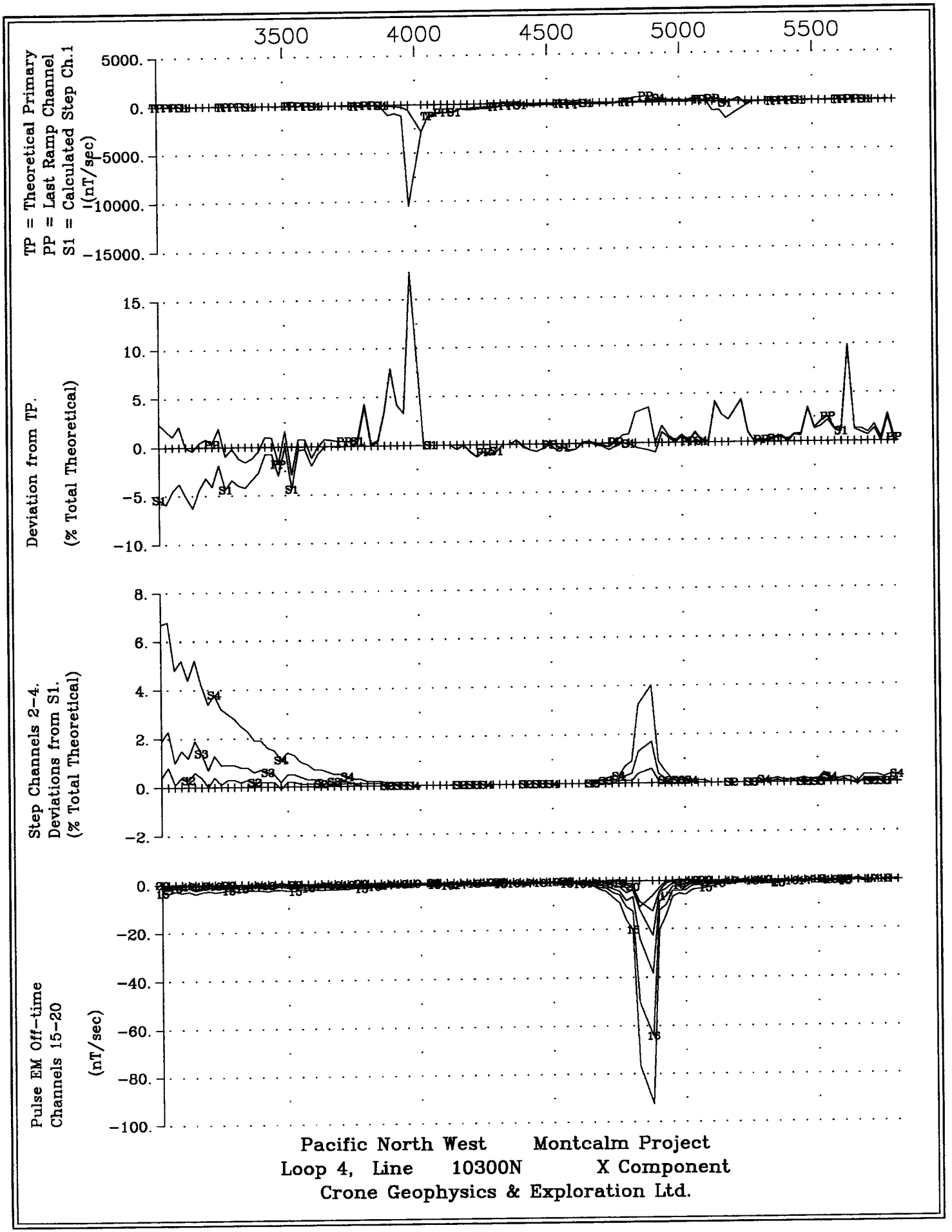
Loop 4, Line L9900N Z Component

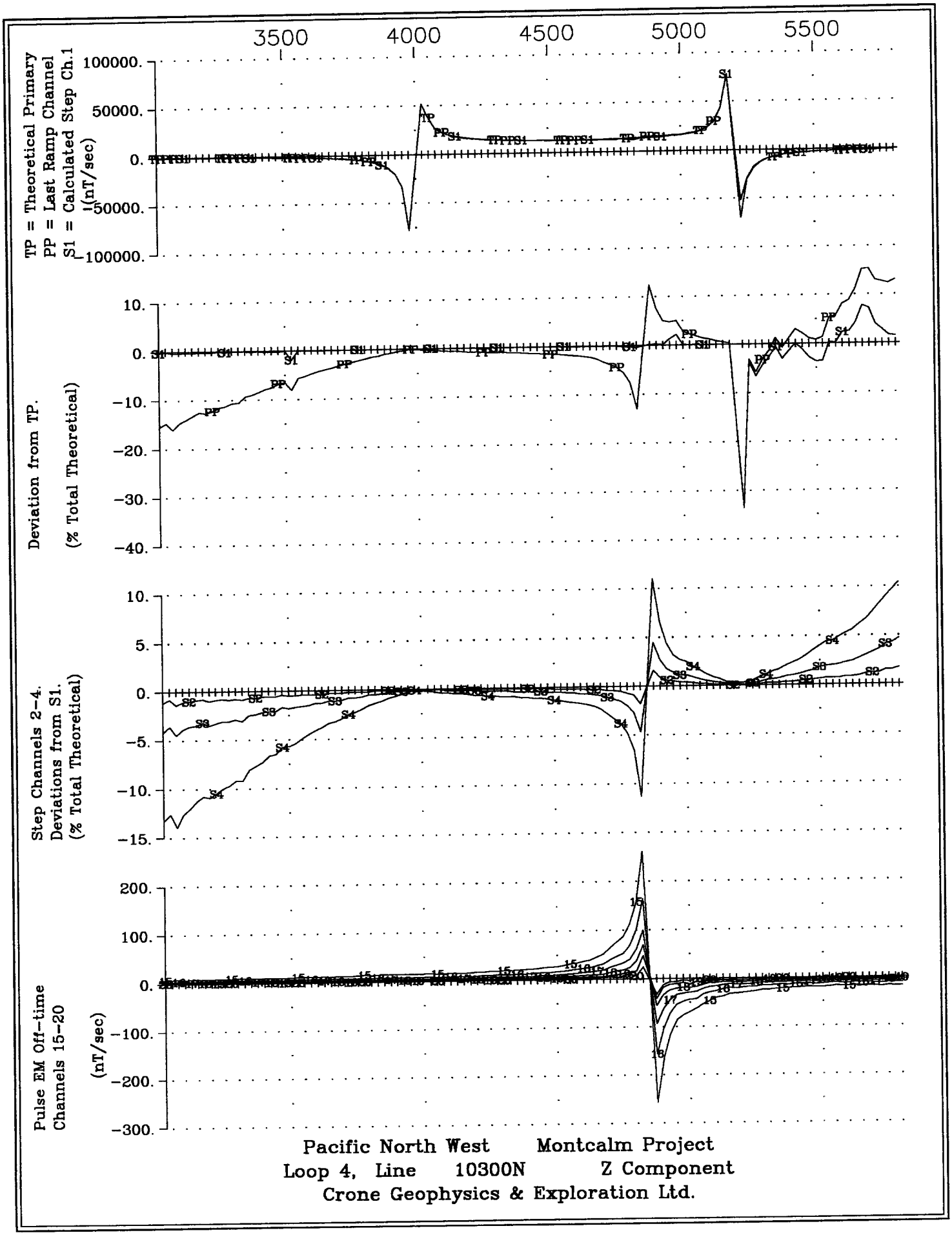
Crone Geophysics & Exploration Ltd.


3000
3500
4000
4500
5000
5500
TP = Theoretical Primary
PP = Last Ramp Channel
S1 = Calculated Step Ch.1
(nT/sec)
5000.
0.
-5000.
-10000.
-15000.
Deviation from TP.
(% Total Theoretical)
20.
15.
10.
5.
0.
-5.
Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
8.
6.
4.
2.
0.
-2.
Pulse EM Off-time
Channels 15-20
(nT/sec)
0.
-50.
-100.
-150.
-200.
-250.
Pacific North West Montcalm Project
Loop 4, Line 10100N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 4, Line 10100N Z Component
Crone Geophysics & Exploration Ltd.

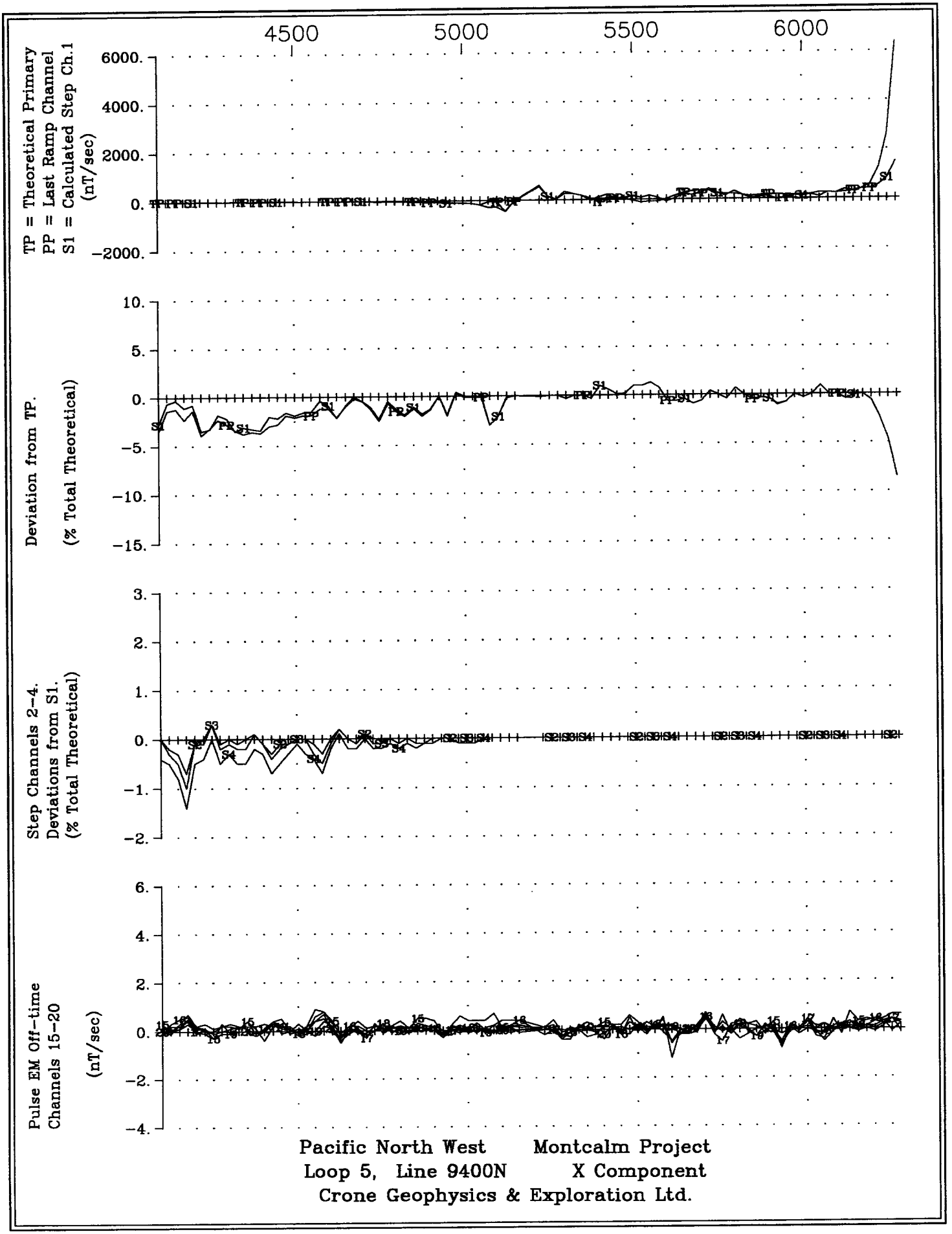

3500
4000
4500
5000
5500
TP = Theoretical Primary
PP = Last Ramp Channel
S1 = Calculated Step Ch.1
1(nT/sec)
5000.
0.
-5000.
-10000.
-15000.
Deviation from TP.
(% Total Theoretical)
15.
10.
5.
0.
-5.
-10.
Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
8.
6.
4.
2.
0.
-2.
Pulse EM Off-time
Channels 15-20
(nT/sec)
0.
-20.
-40.
-60.
-80.
-100.
Pacific North West Montcalm Project
Loop 4, Line 10300N X Component
Crone Geophysics & Exploration Ltd.



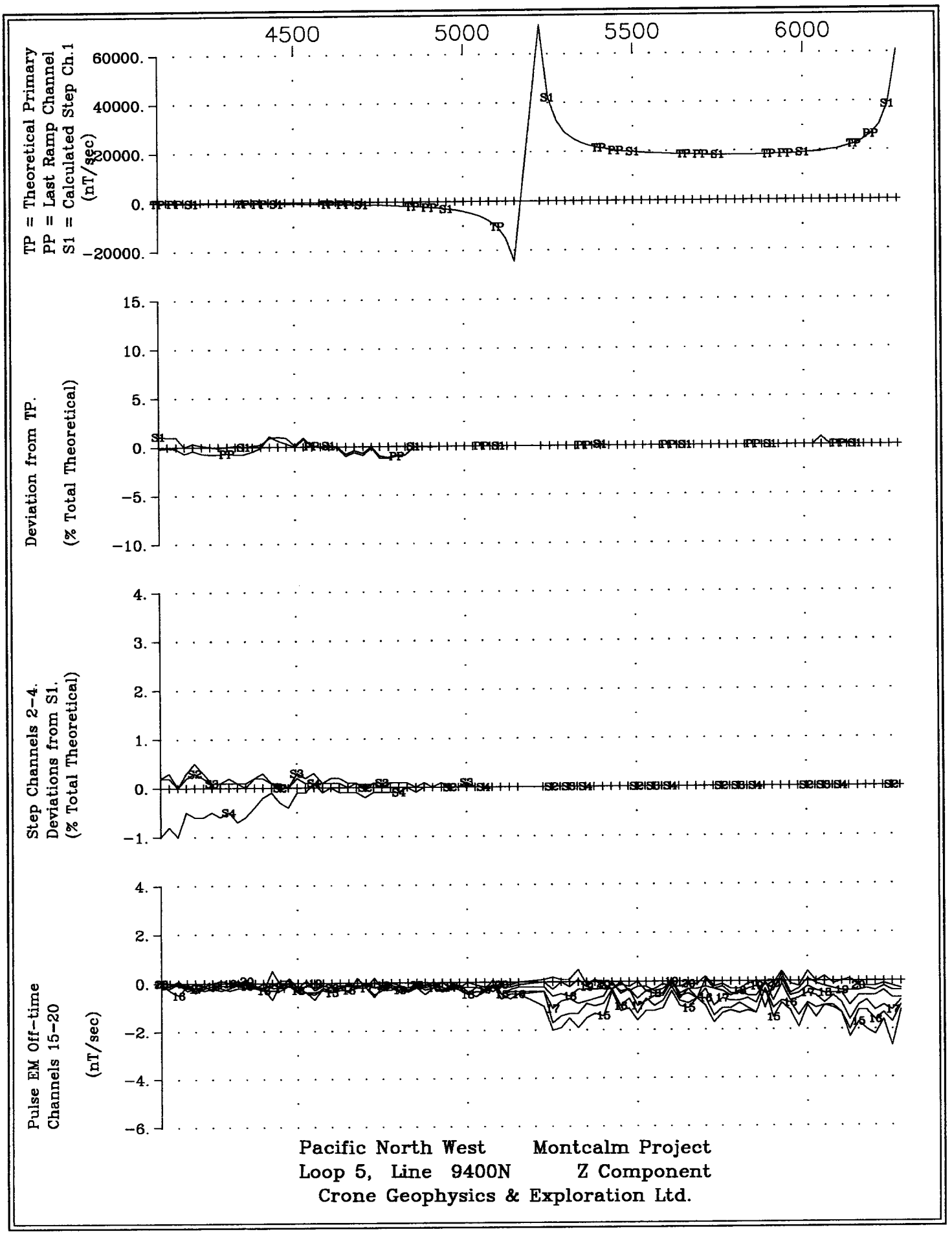
Pacific North West Montcalm Project

Loop 4, Line 10300N Z Component

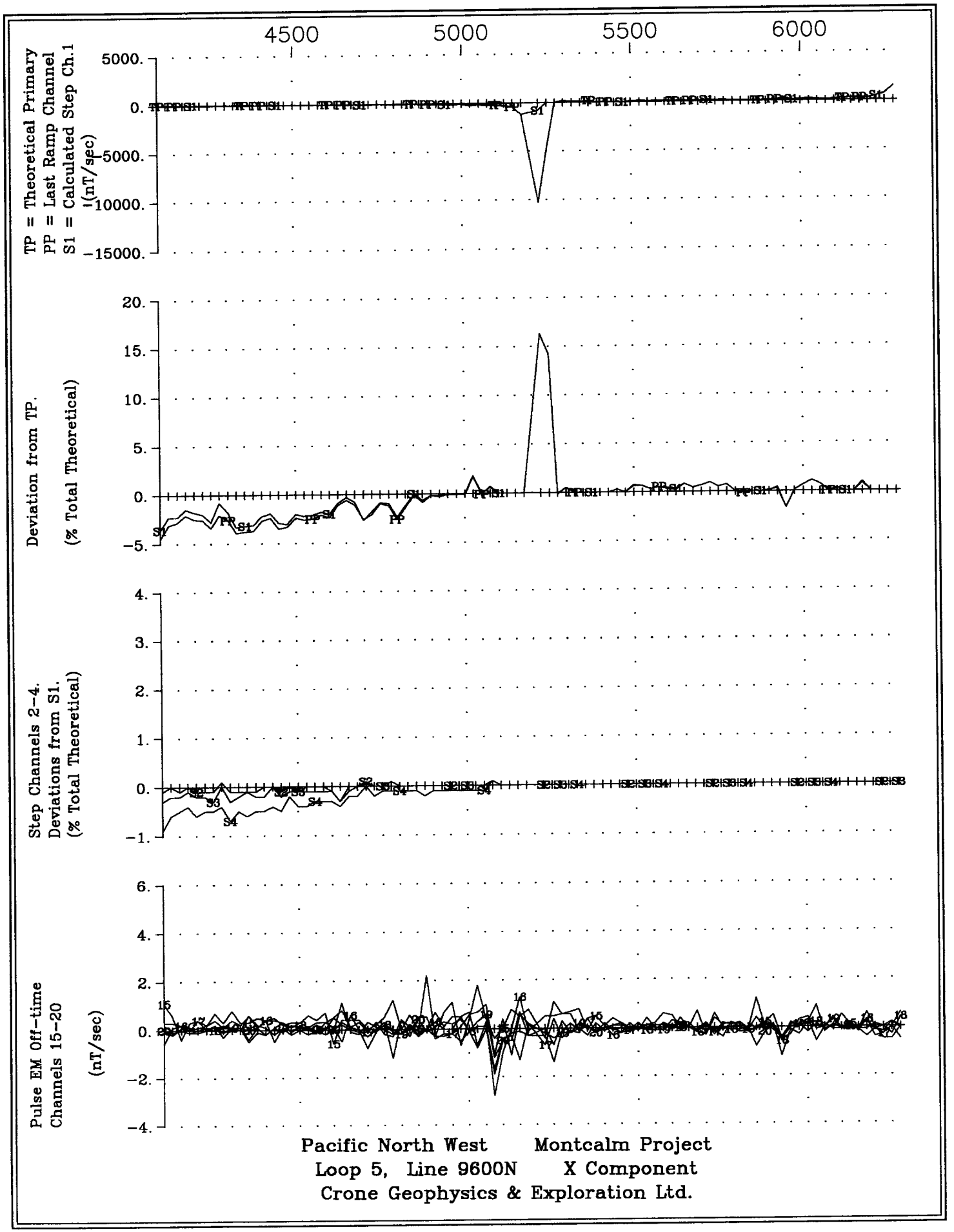
Crone Geophysics & Exploration Ltd.



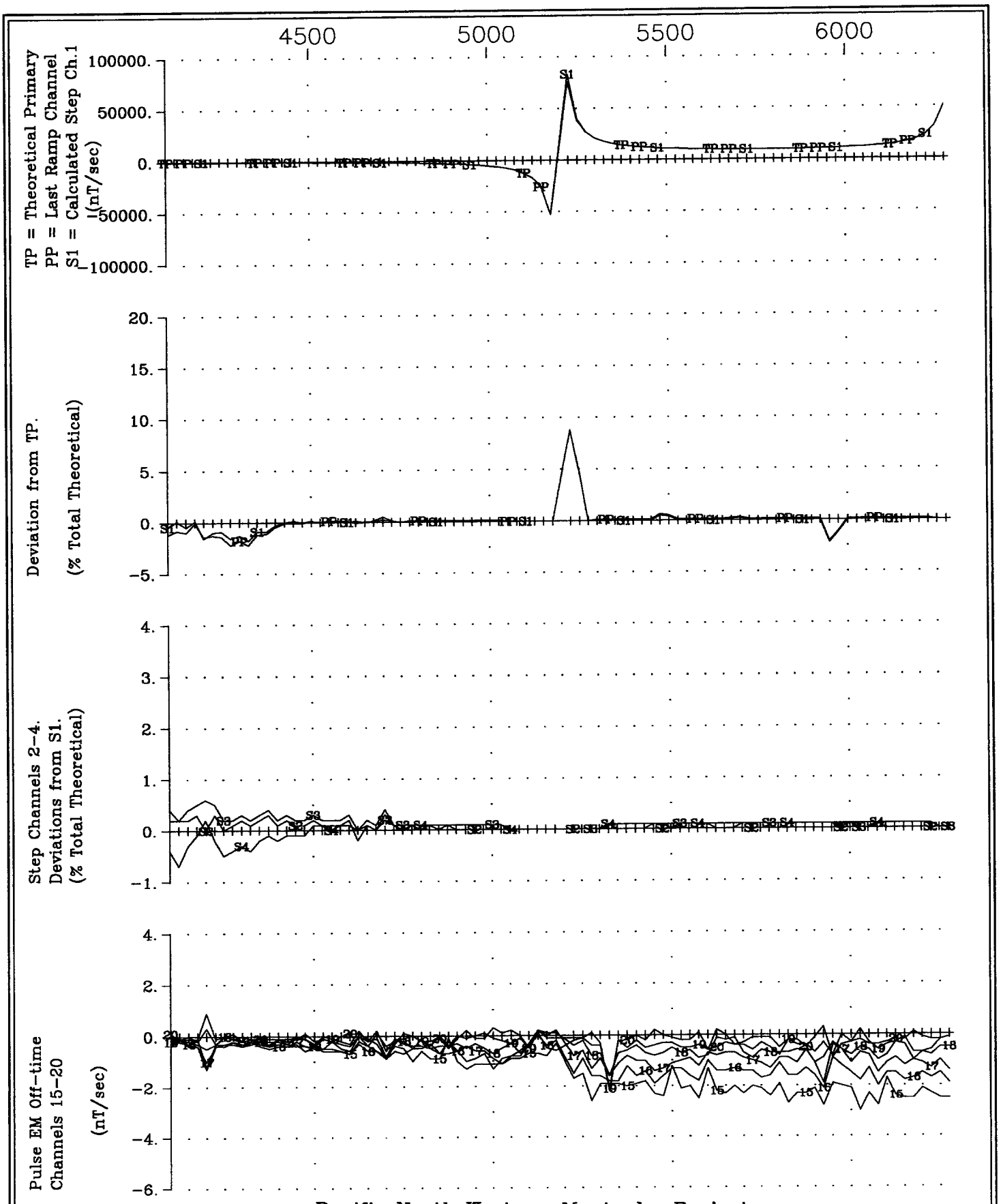
Pacific North West Montcalm Project
Loop 5, Line 9400N X Component
Crone Geophysics & Exploration Ltd.



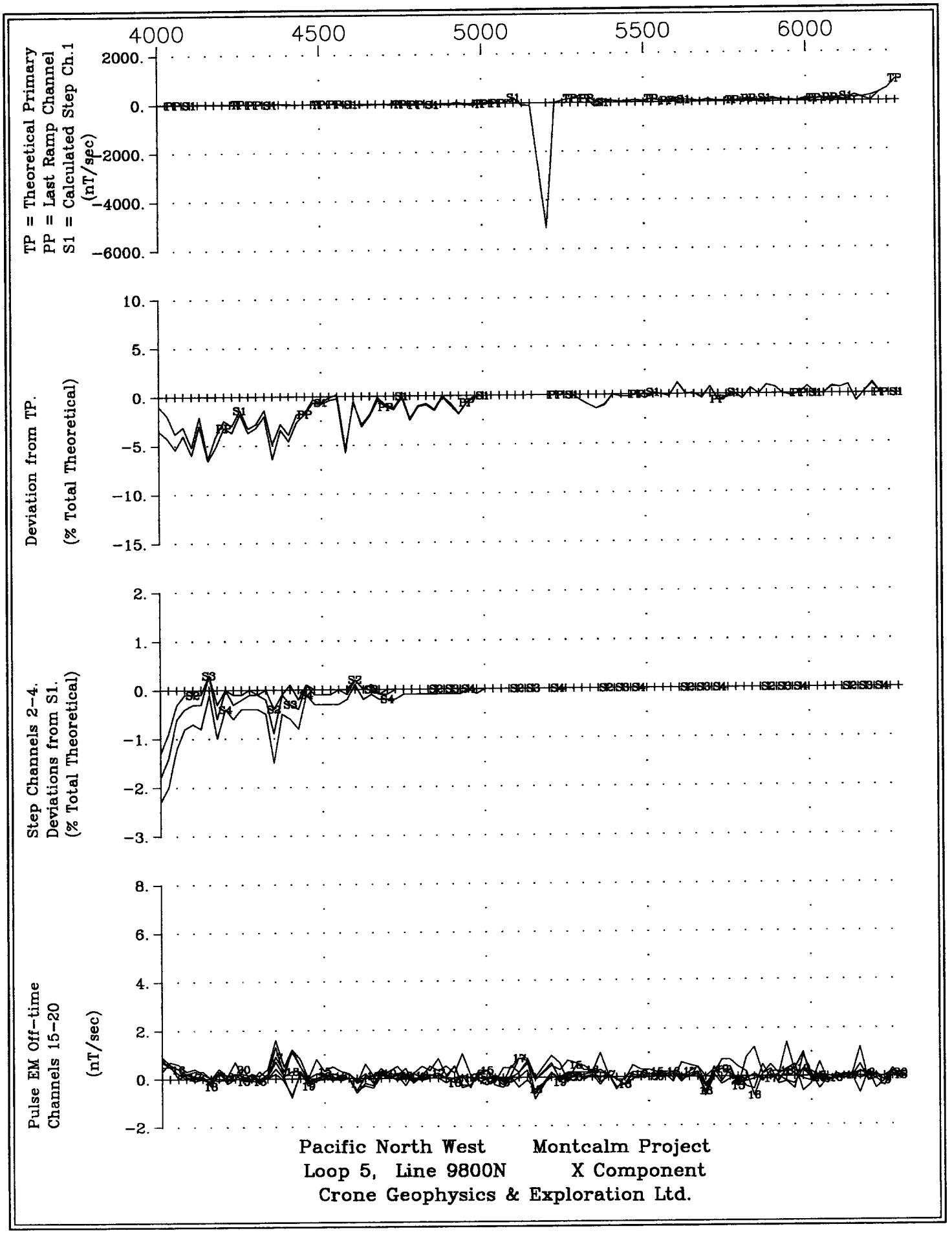
Pacific North West Montcalm Project
Loop 5, Line 9400N Z Component
Crone Geophysics & Exploration Ltd.



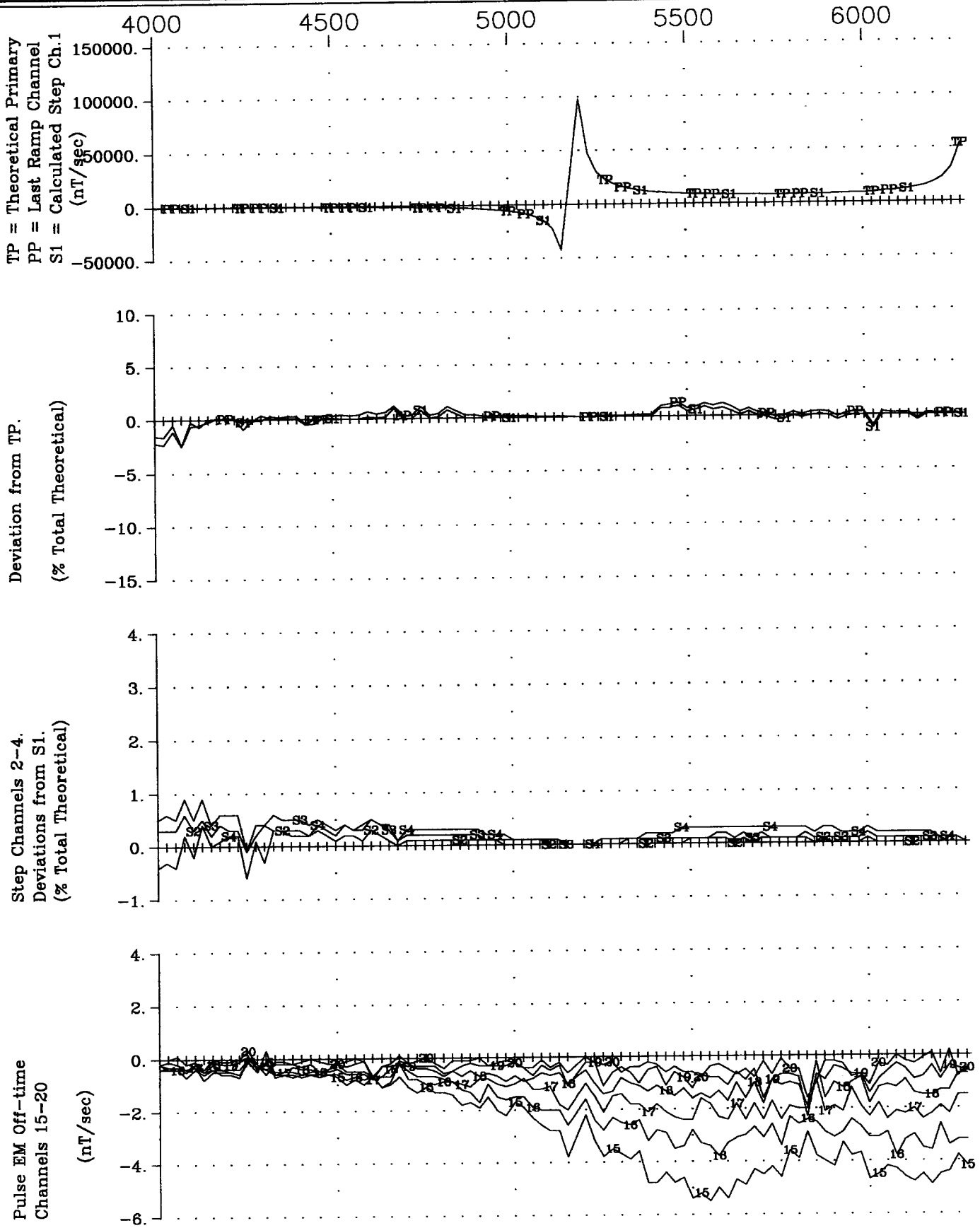
Pacific North West Montcalm Project
Loop 5, Line 9600N X Component
Crone Geophysics & Exploration Ltd.



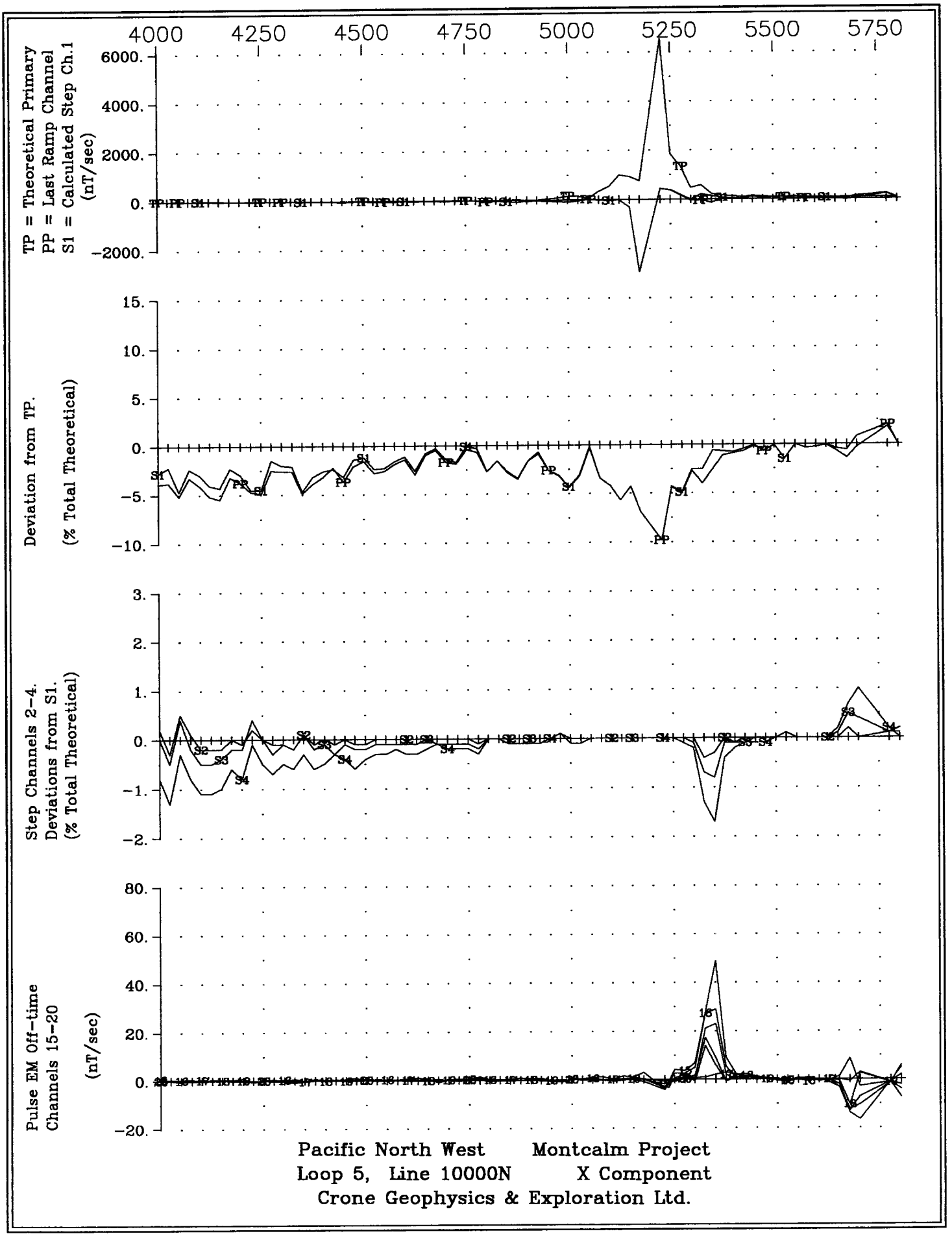
Pacific North West Montcalm Project
Loop 5, Line 9600N Z Component
Crone Geophysics & Exploration Ltd.



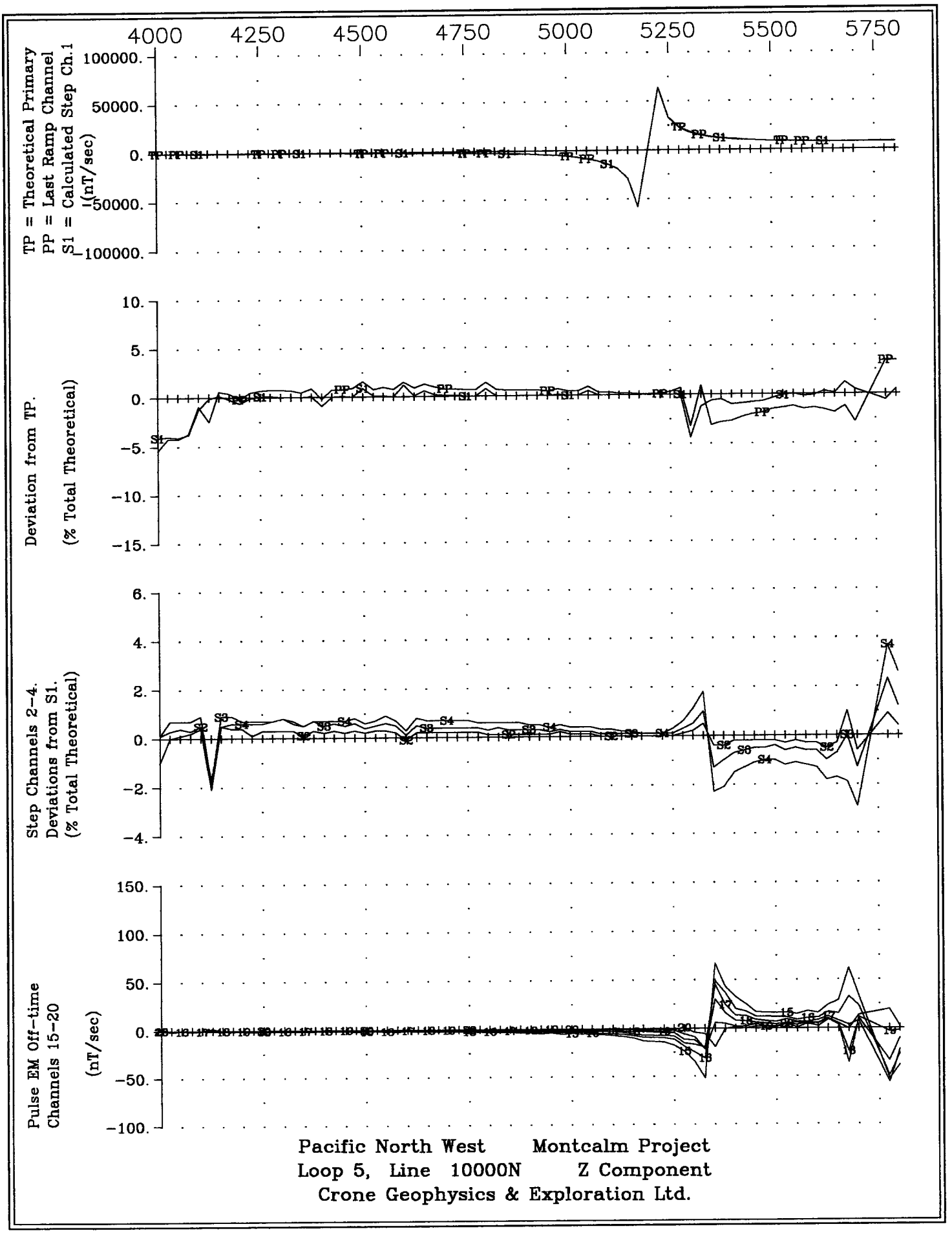
Pacific North West Montcalm Project
Loop 5, Line 9800N X Component
Crone Geophysics & Exploration Ltd.



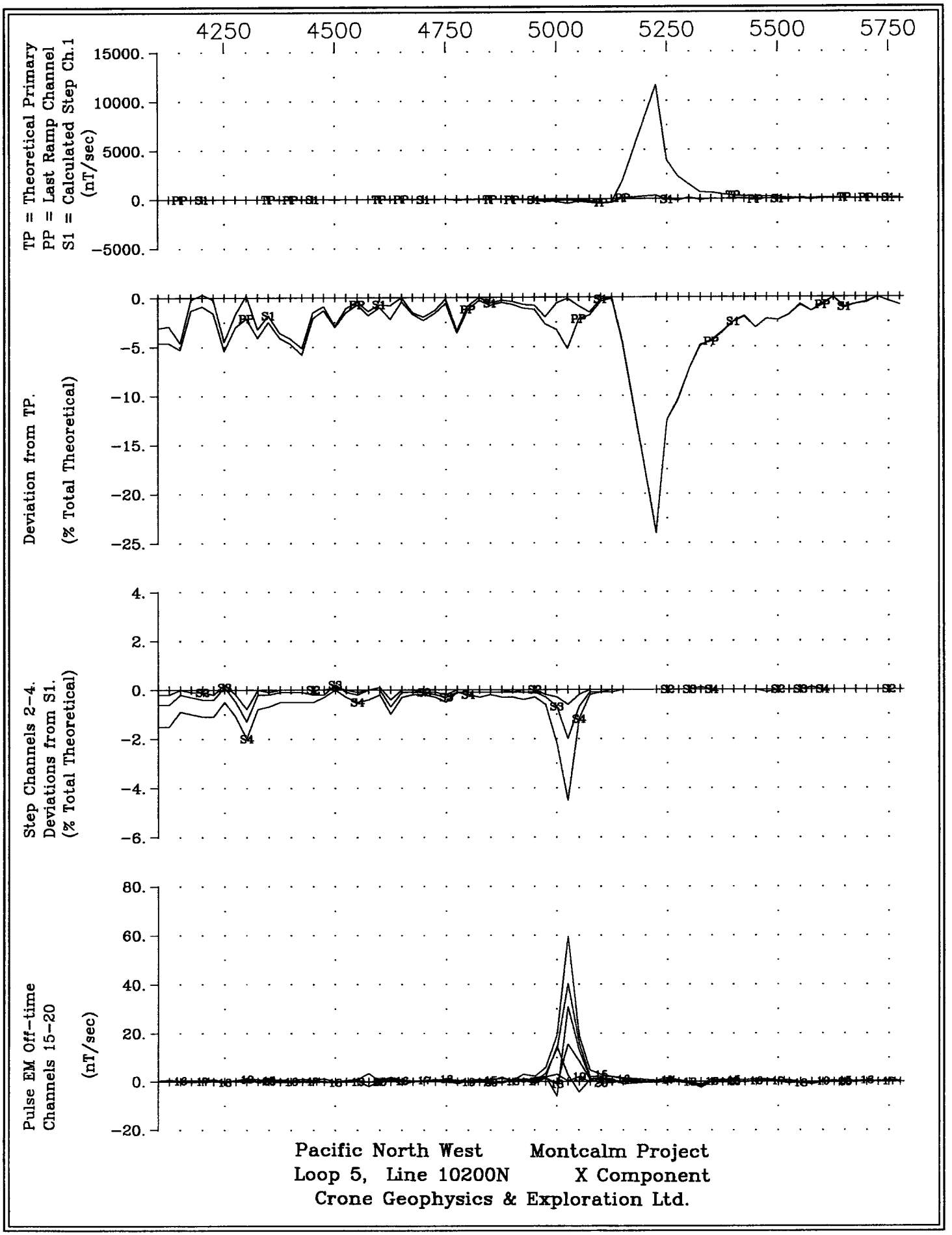
Pacific North West Montcalm Project
Loop 5, Line 9800N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 5, Line 10000N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 5, Line 10000N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
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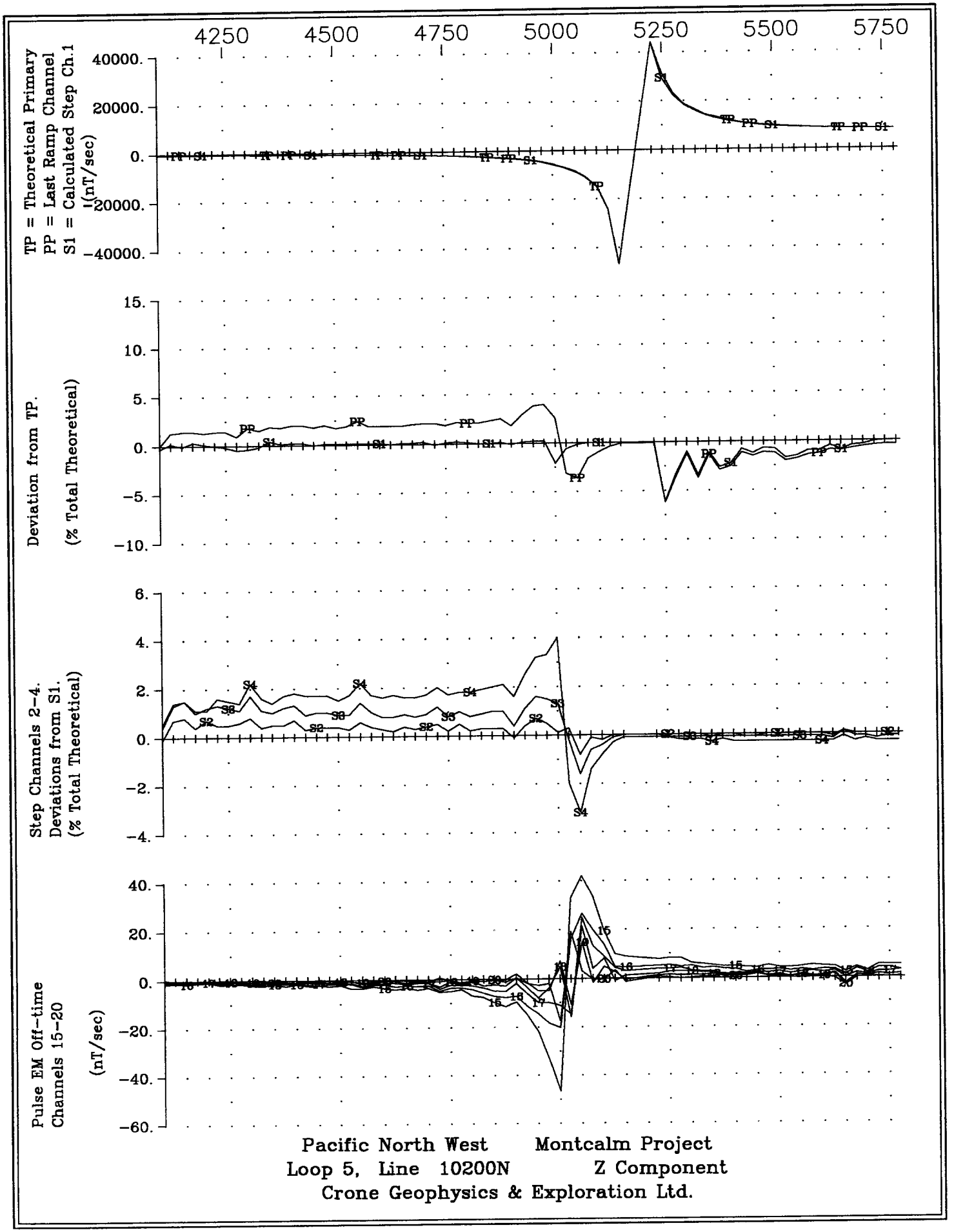
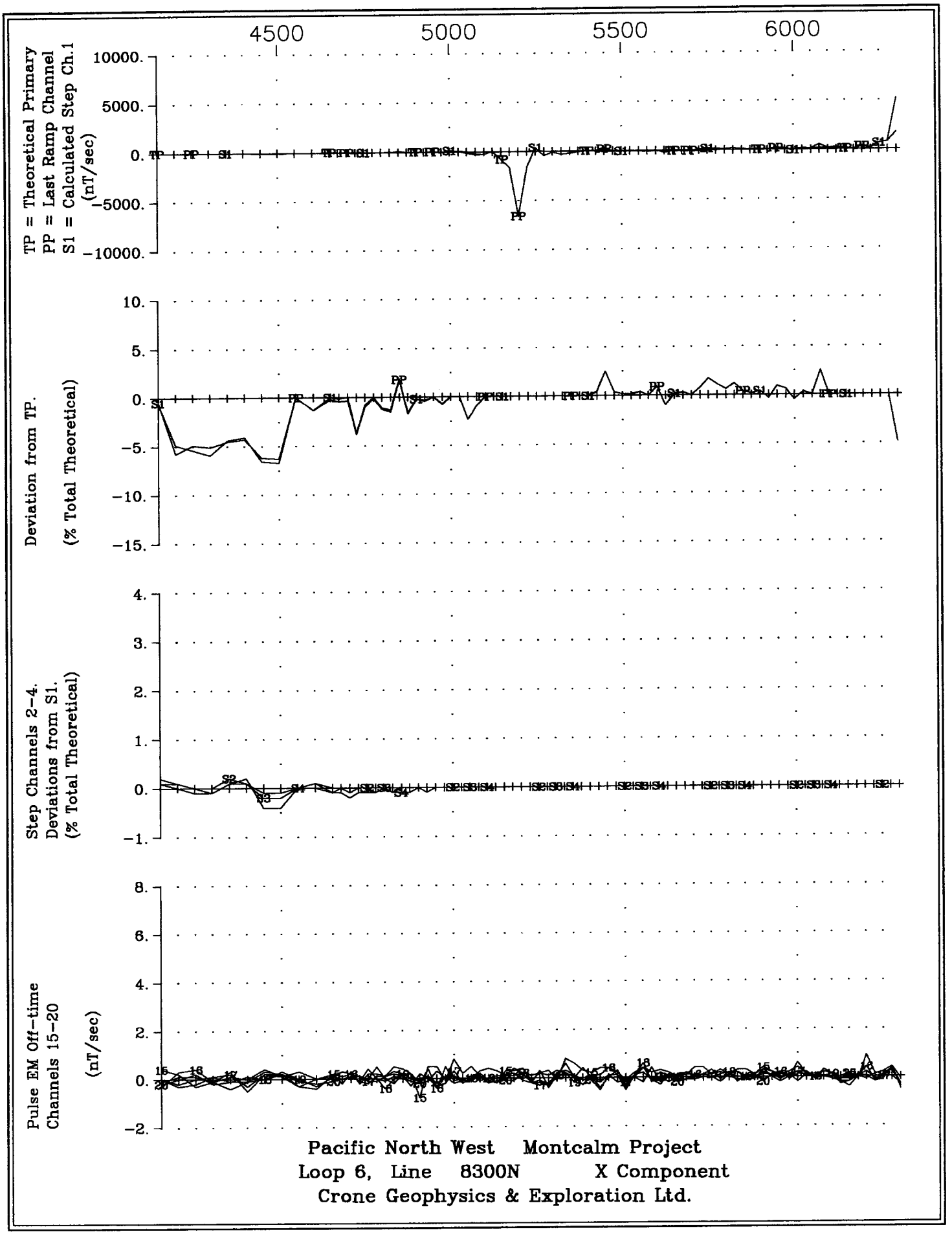
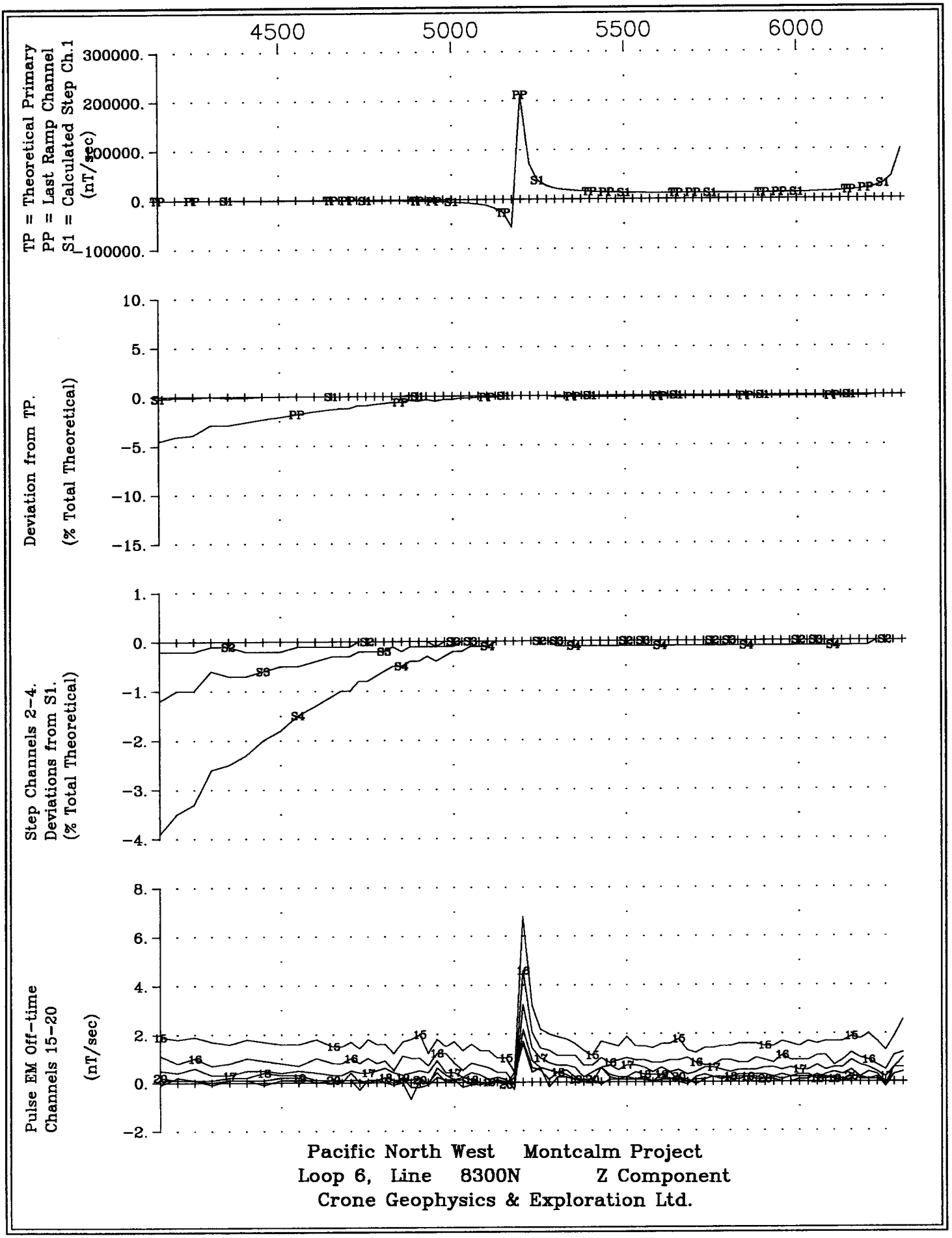


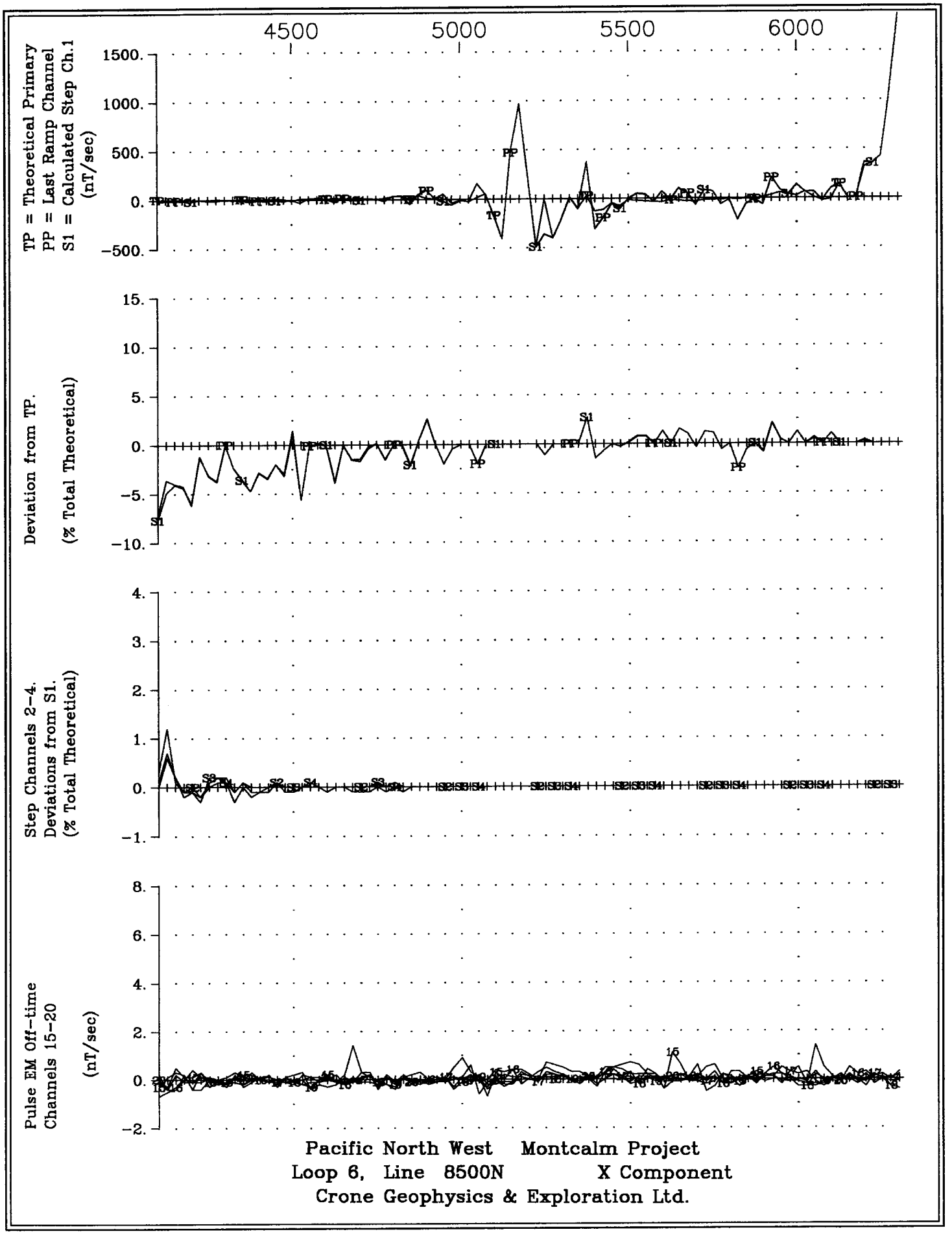
Pacific North West Montcalm Project
Loop 5, Line 10200N Z Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 8300N X Component
Crone Geophysics & Exploration Ltd.



Pacific North West Montcalm Project
Loop 6, Line 8300N Z Component
Crone Geophysics & Exploration Ltd.



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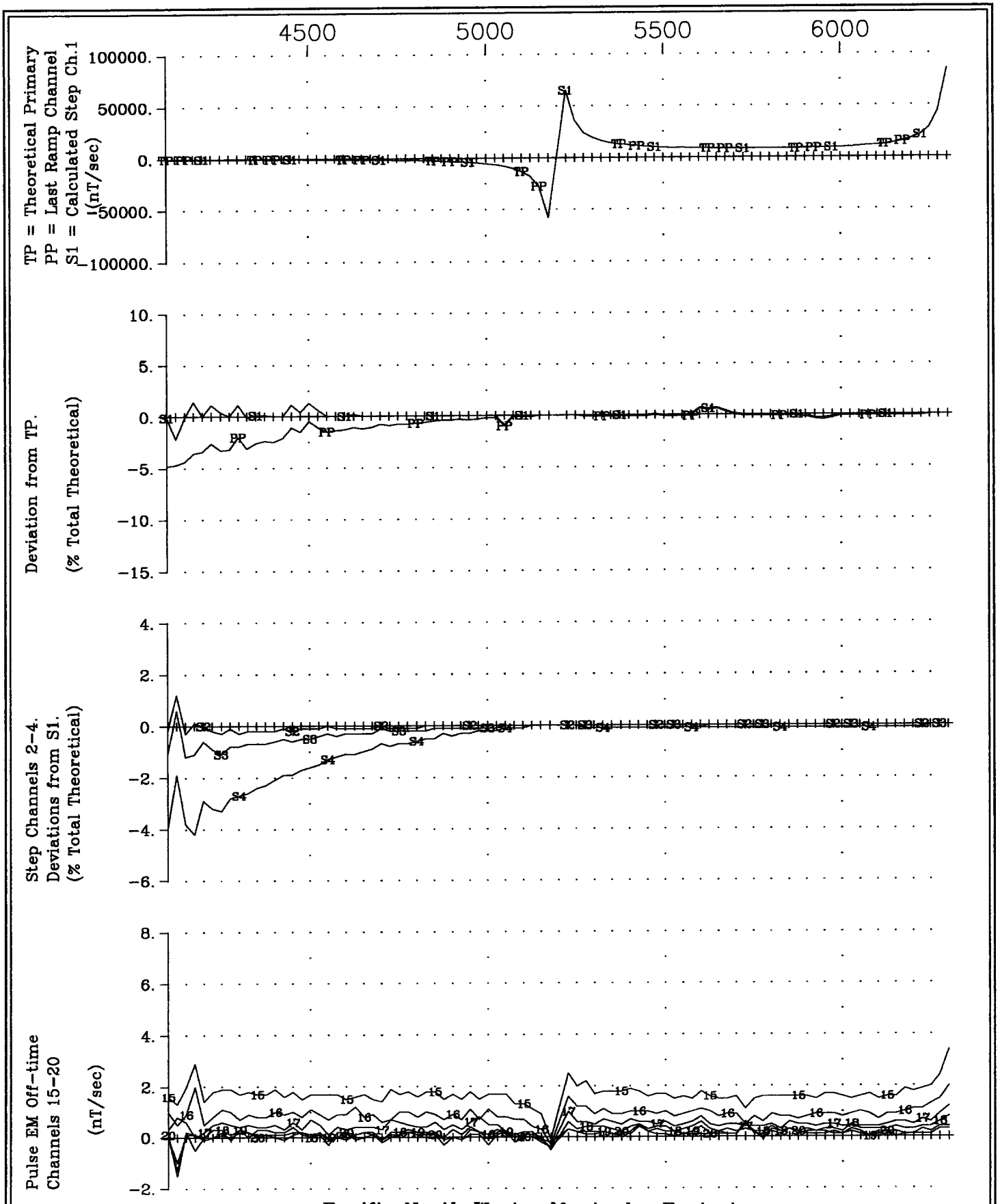

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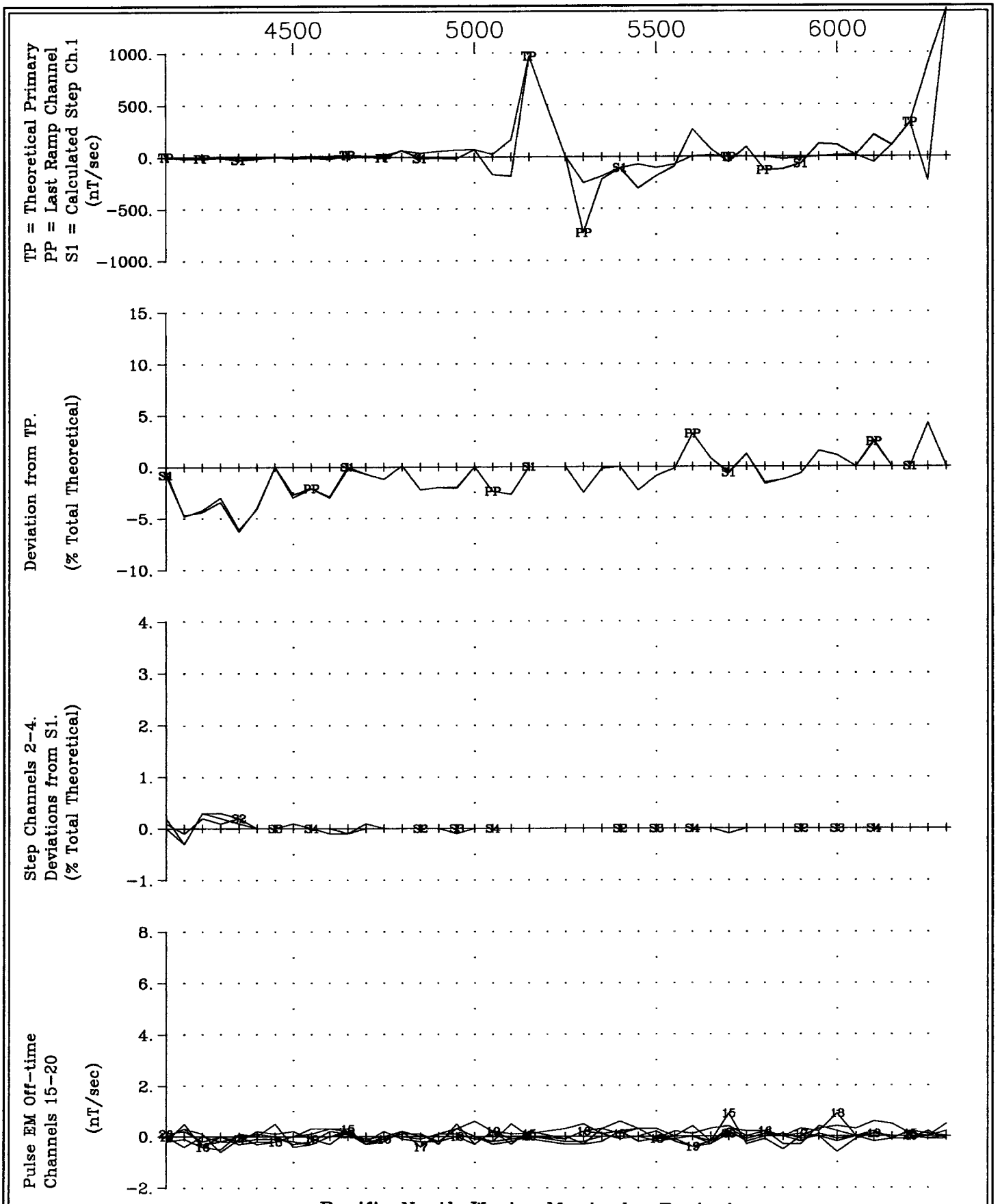

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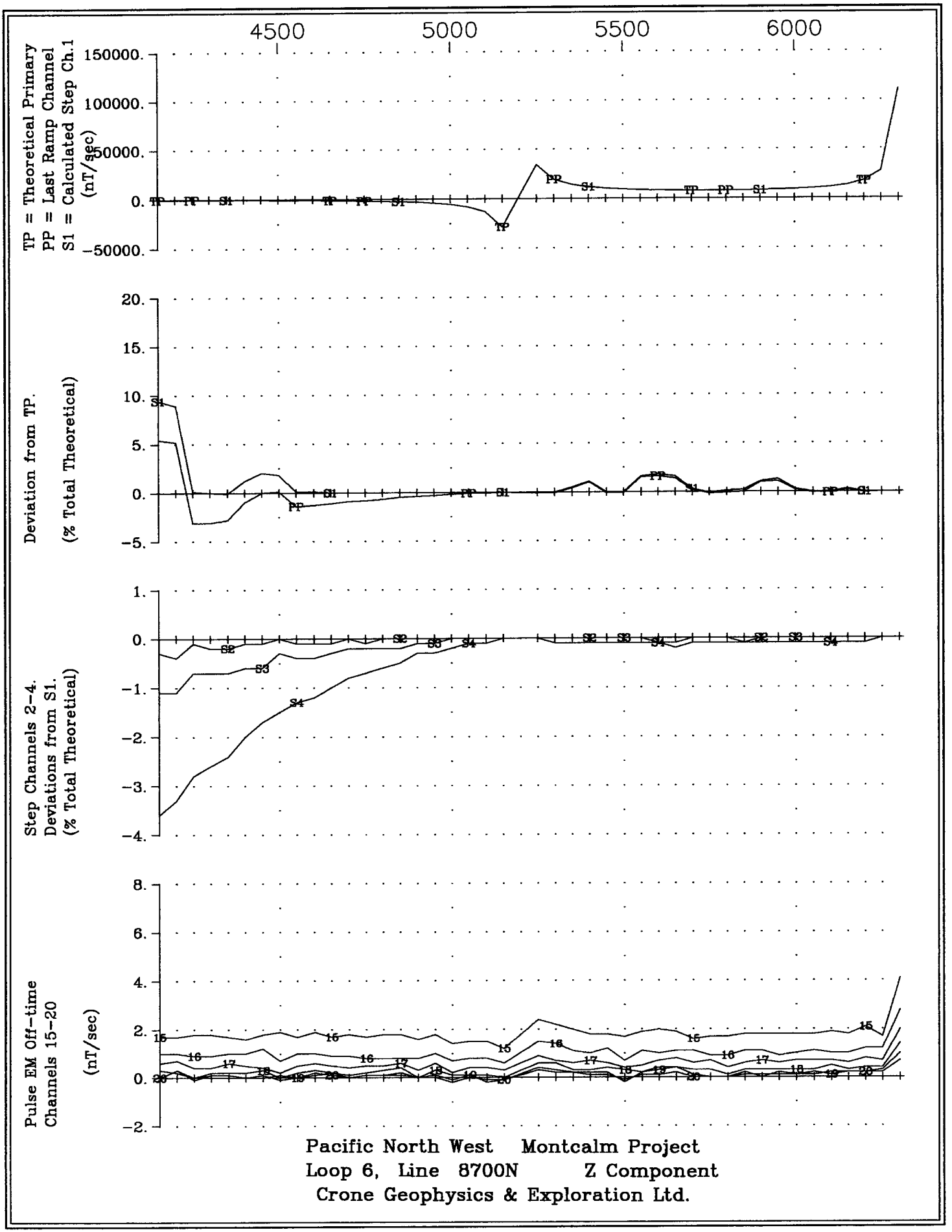

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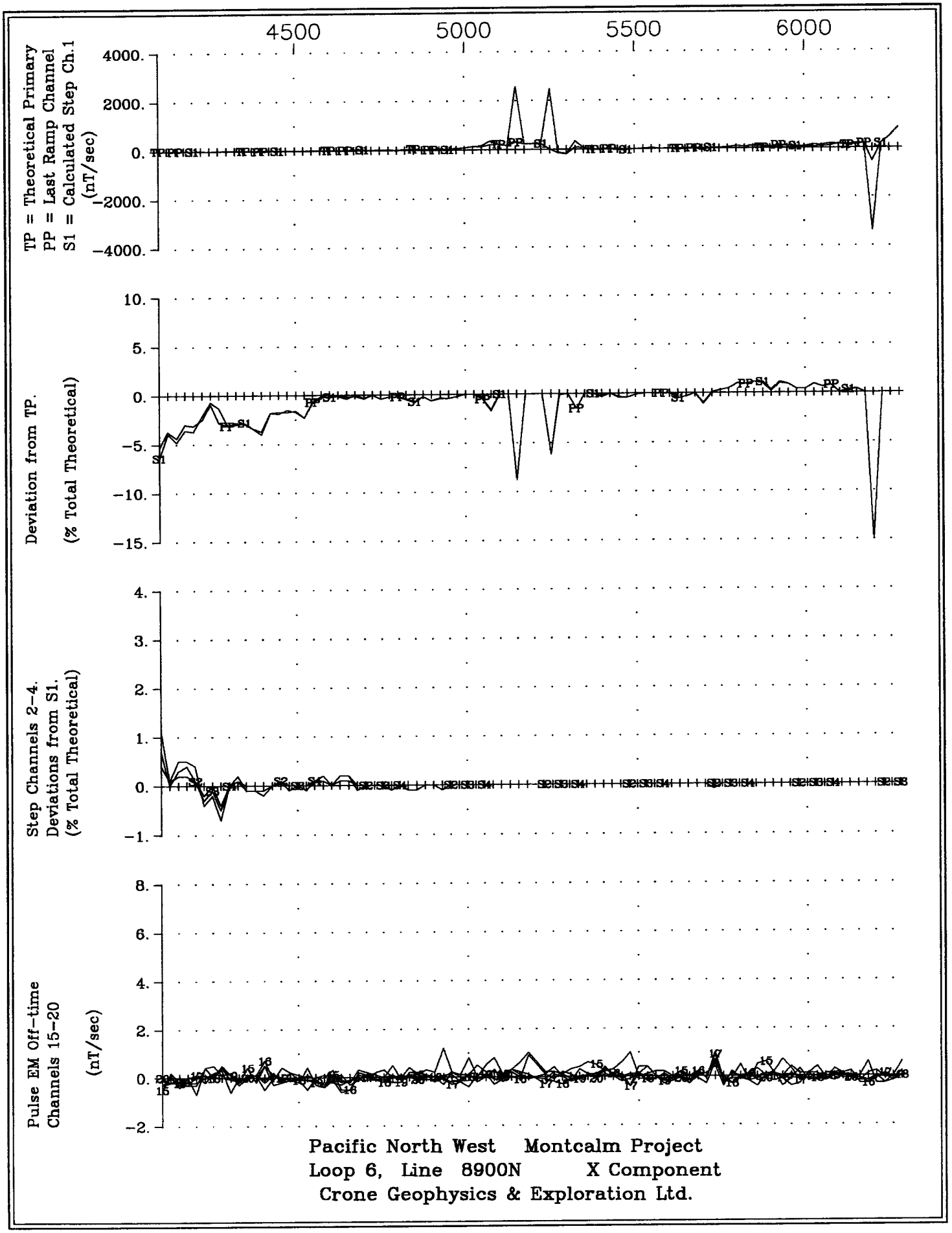

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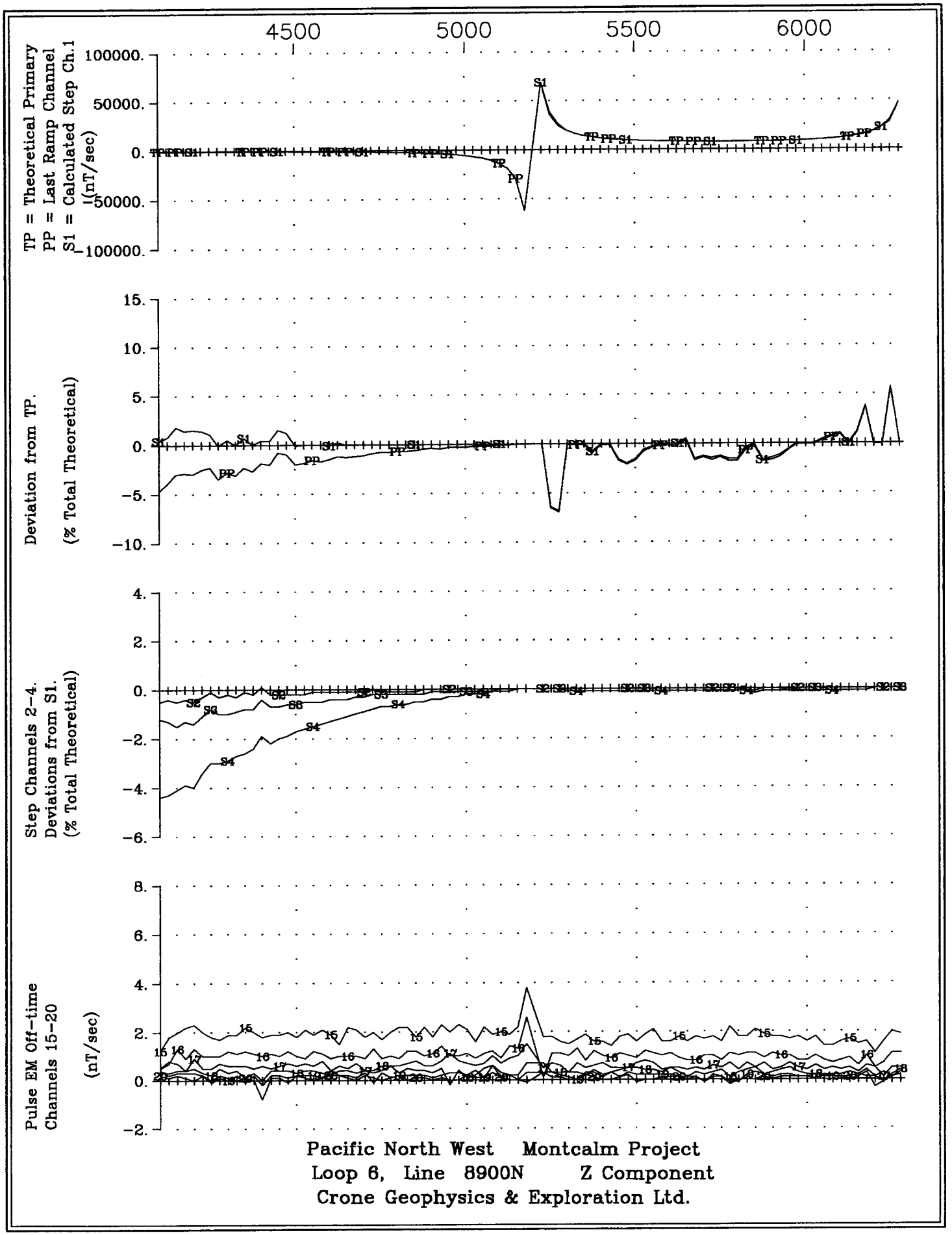
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PP = Last Ramp Channel
S1 = Calculated Step Ch.1
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Deviation from TP.
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Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
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Pulse EM Off-time
Channels 15-20
(nT/sec)
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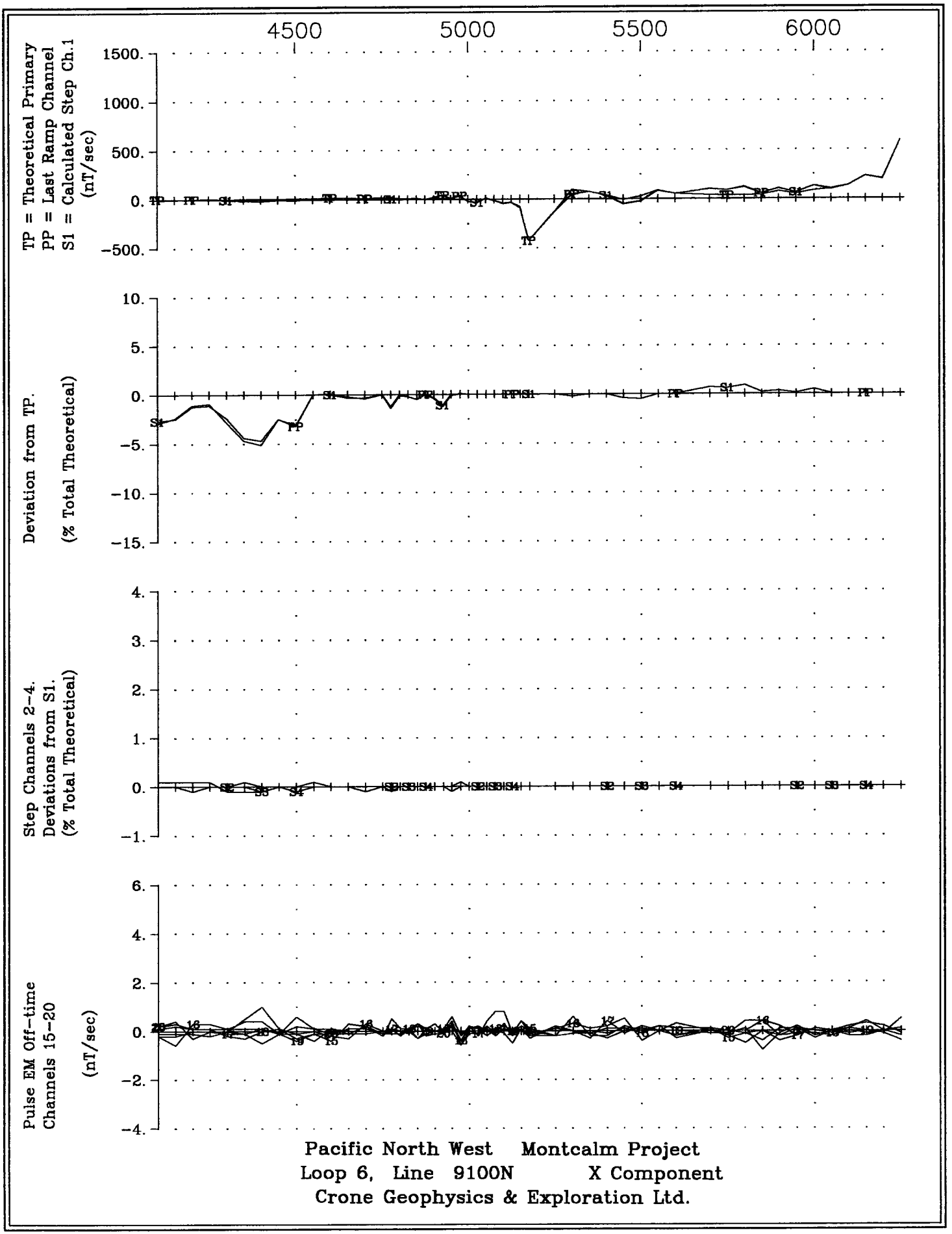

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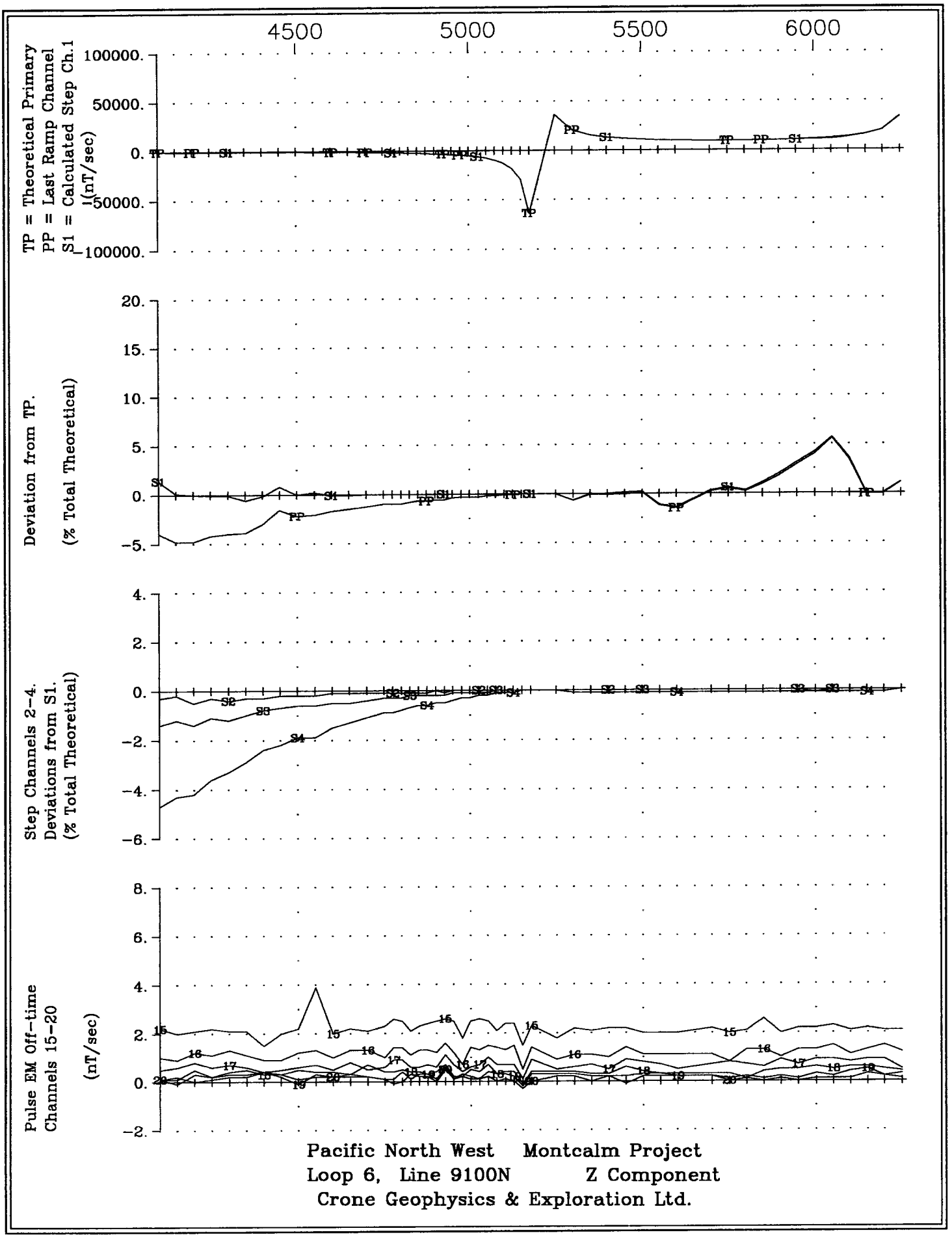

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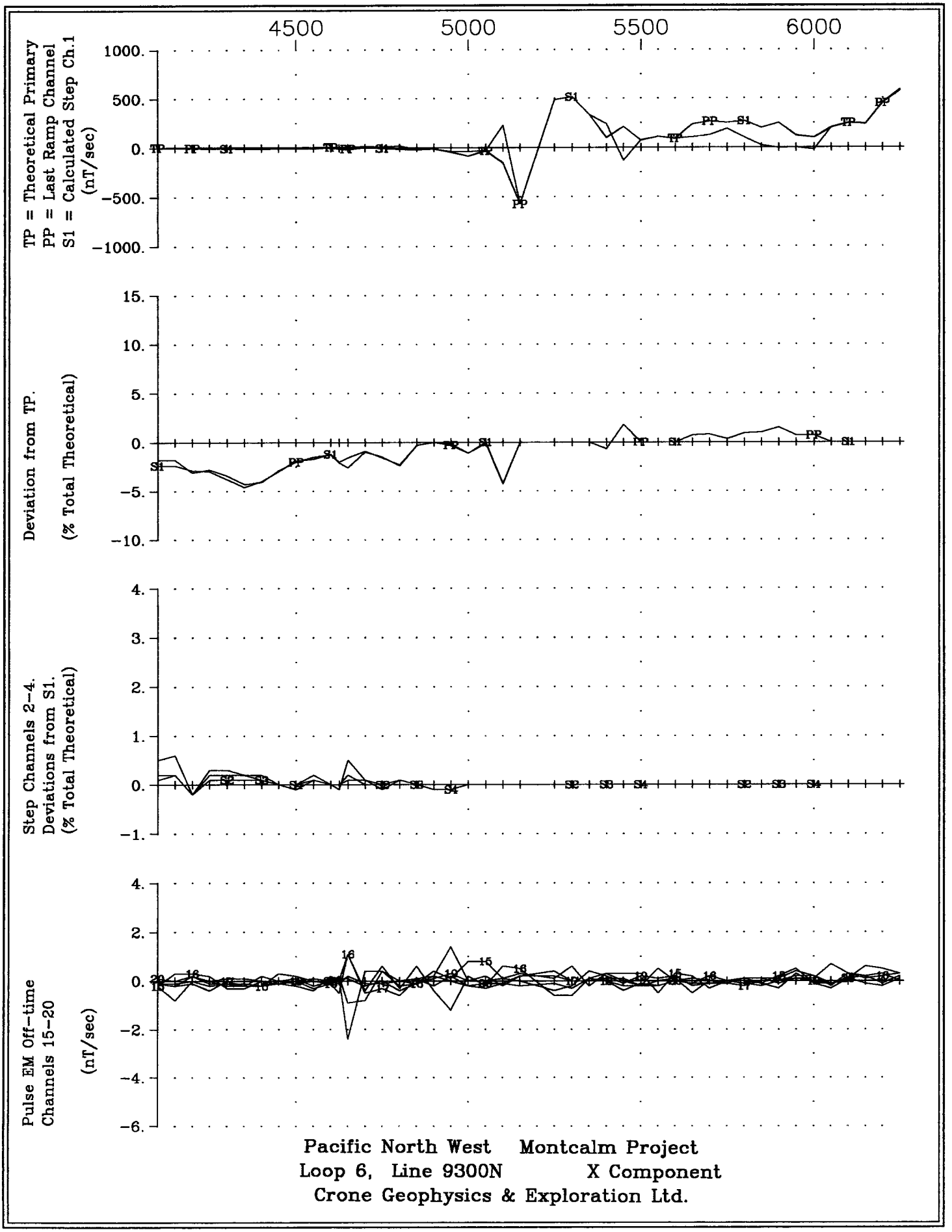

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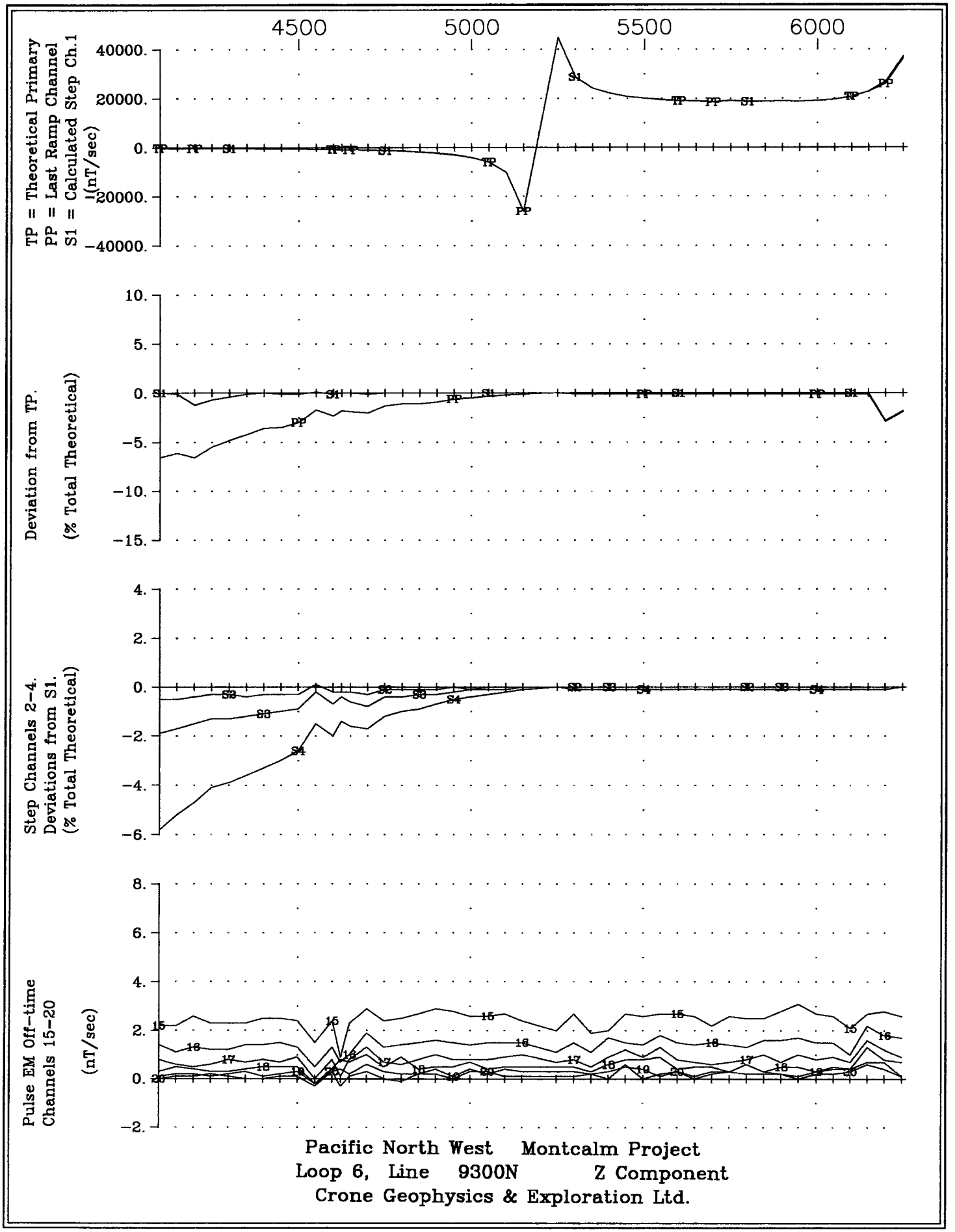

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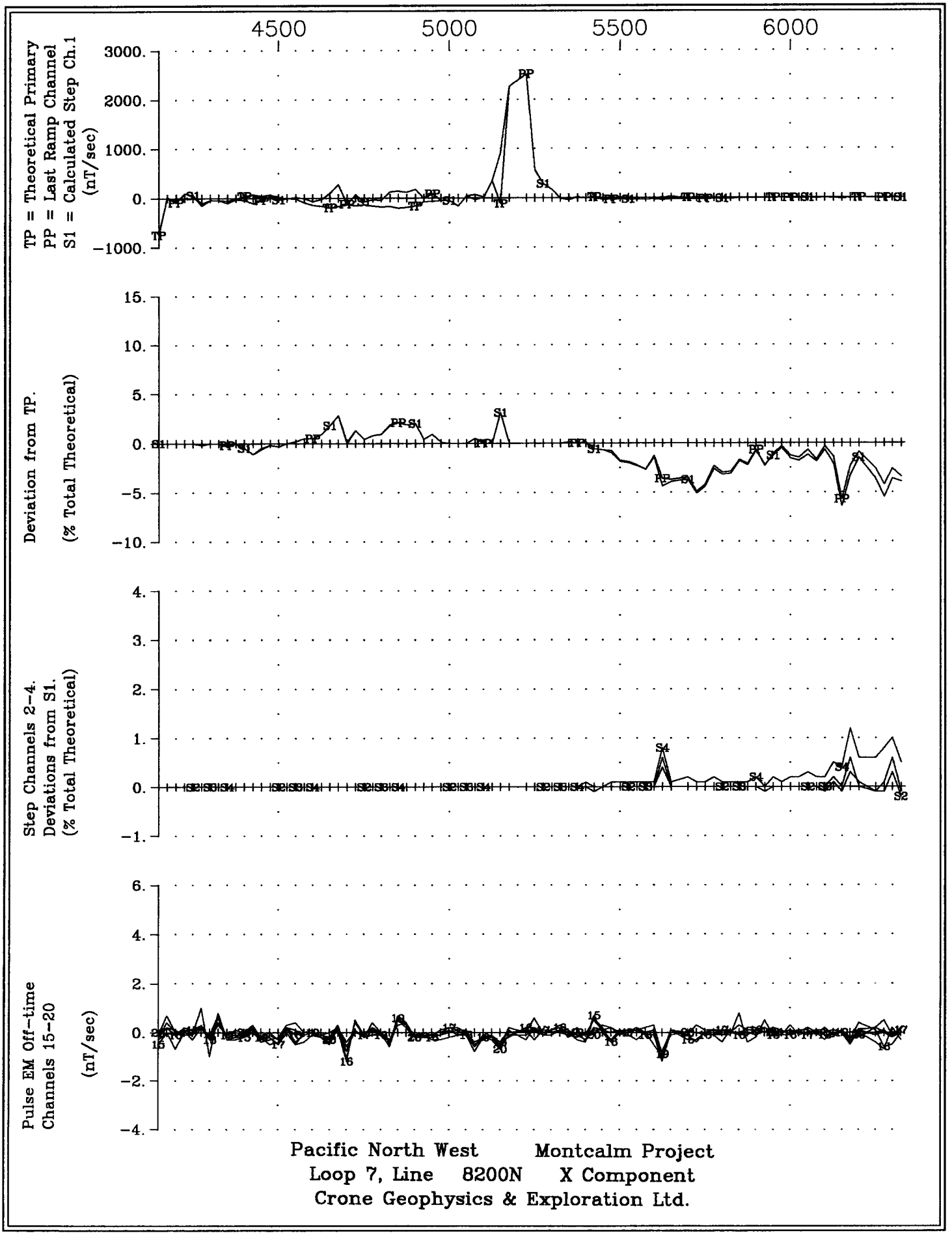

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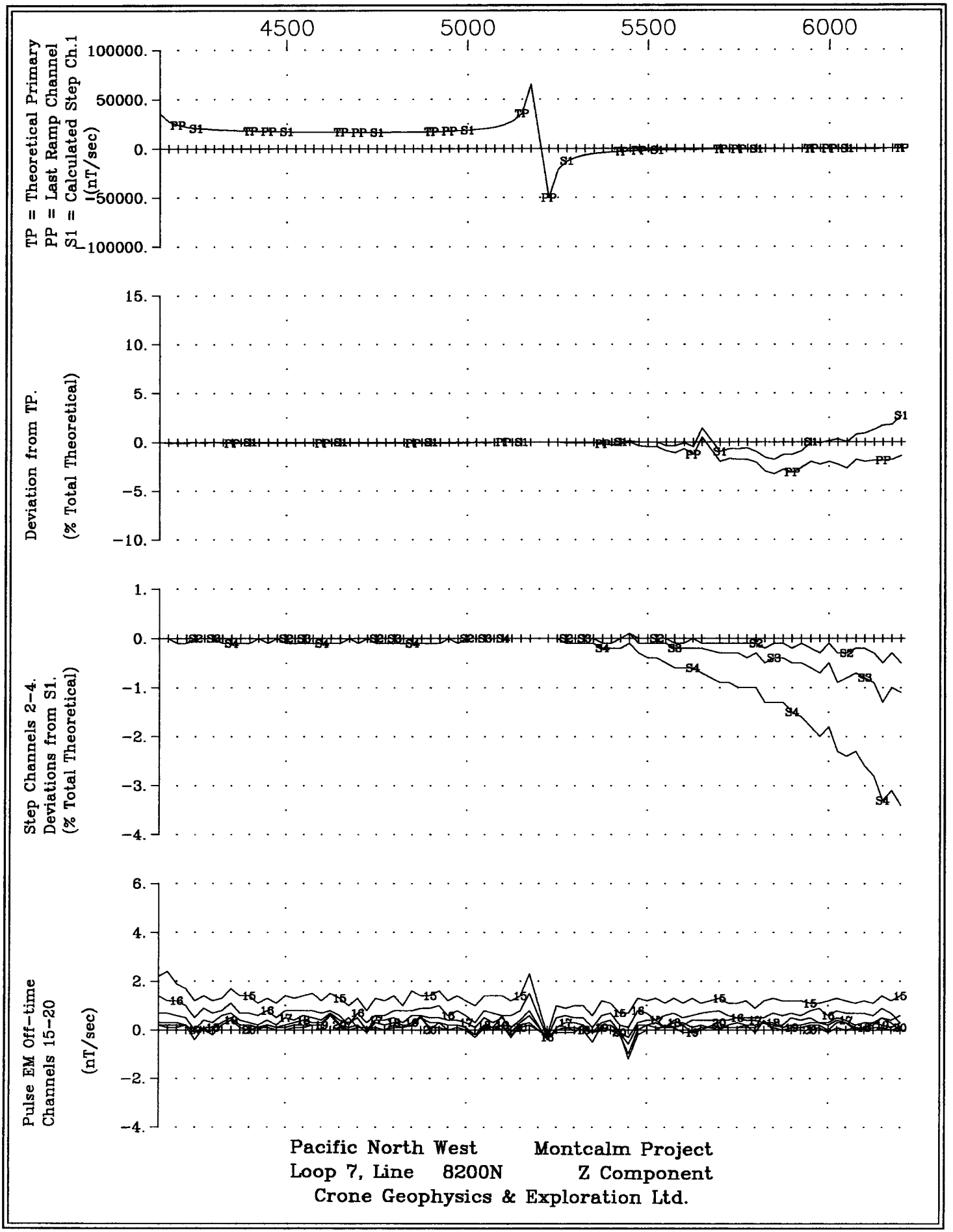
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-100000.
Deviation from TP.
(% Total Theoretical)
15.
10.
5.
0.
-5.
-10.
Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
1.
0.
-1.
-2.
-3.
-4.
Pulse EM Off-time
Channels 15-20
(nT/sec)
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4.
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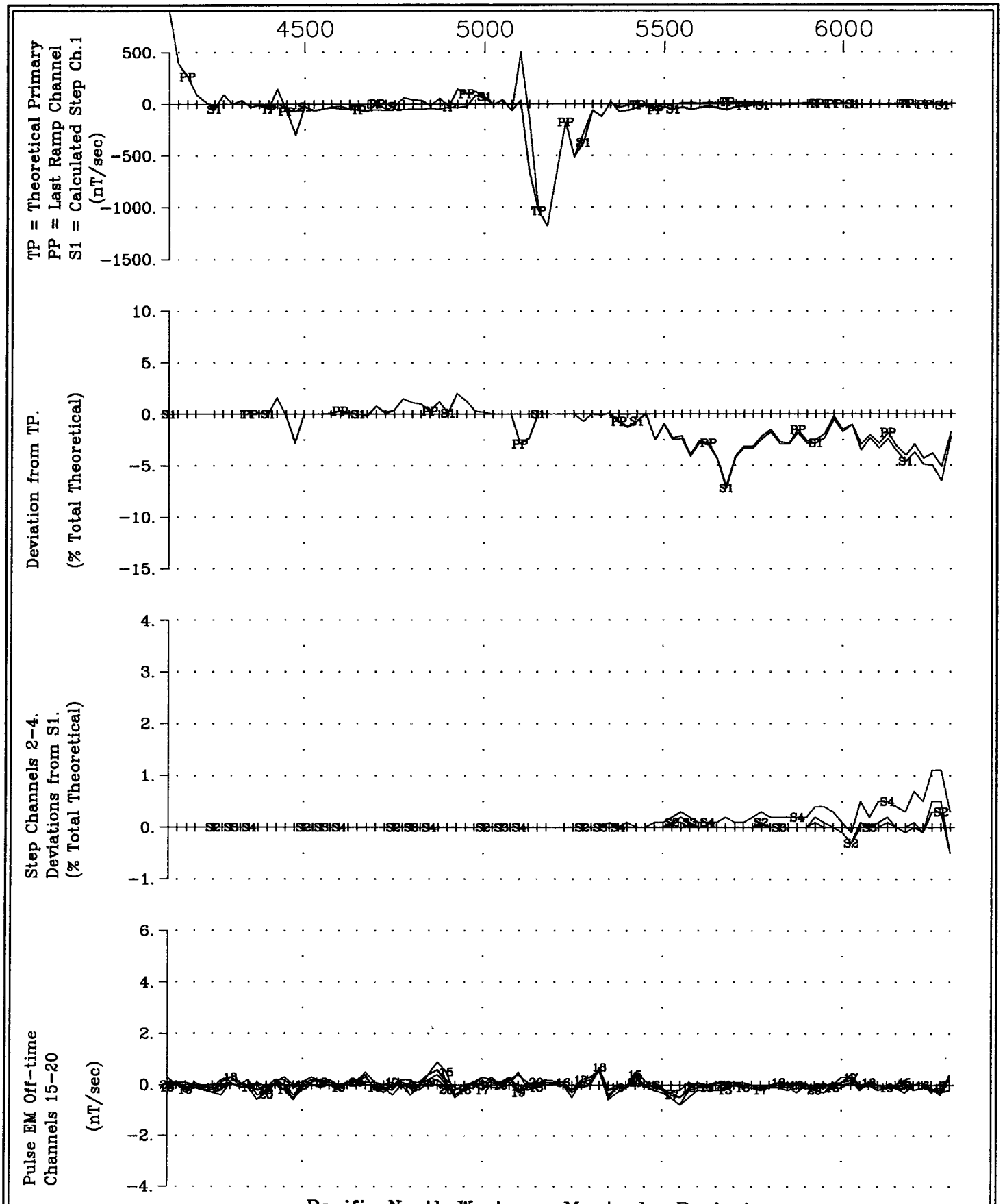
Pacific North West
Montcalm Project
Loop 7, Line 8200N
Z Component
Crone Geophysics & Exploration Ltd.



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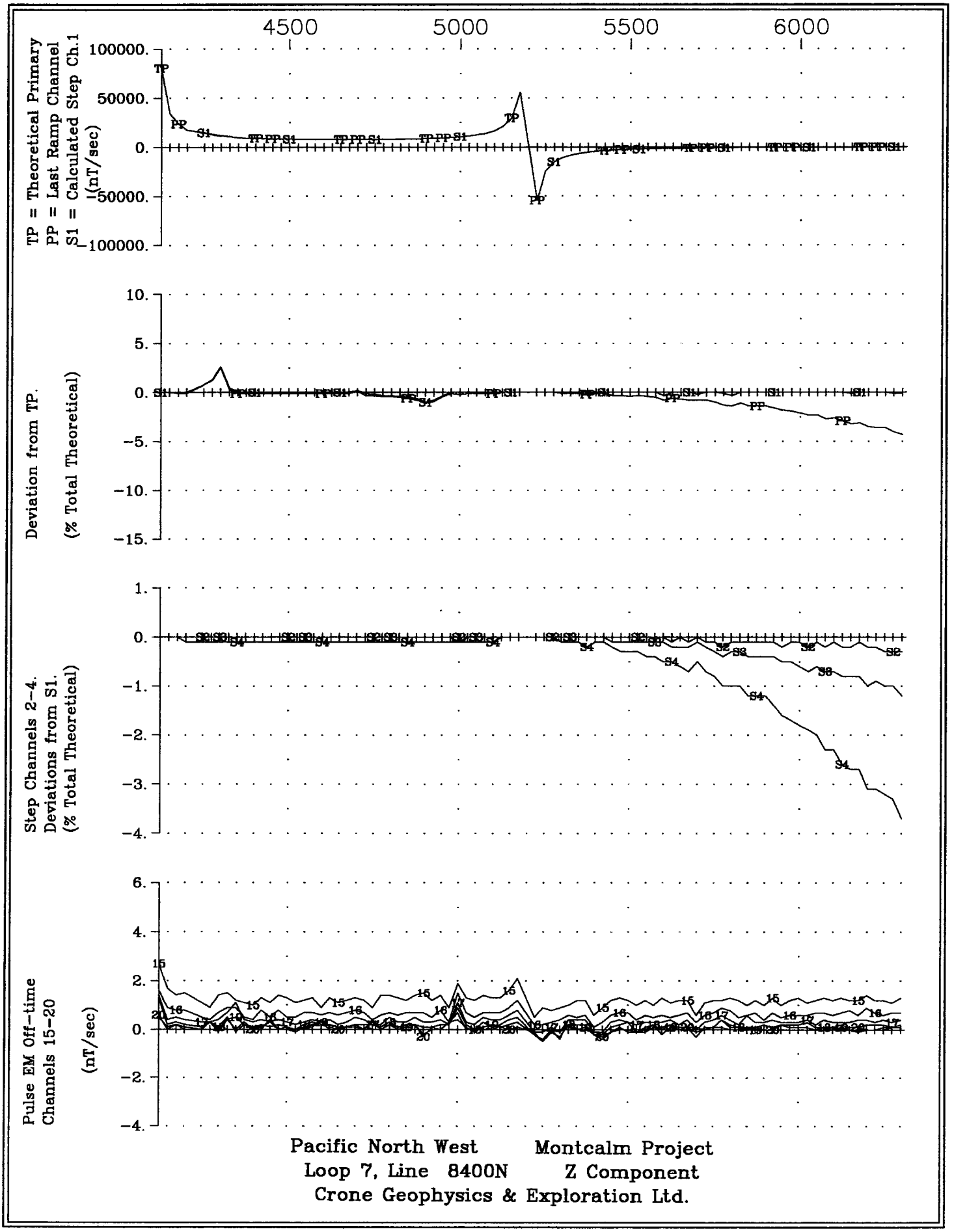
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Pulse EM Off-time
Channels 15-20
(nT/sec)
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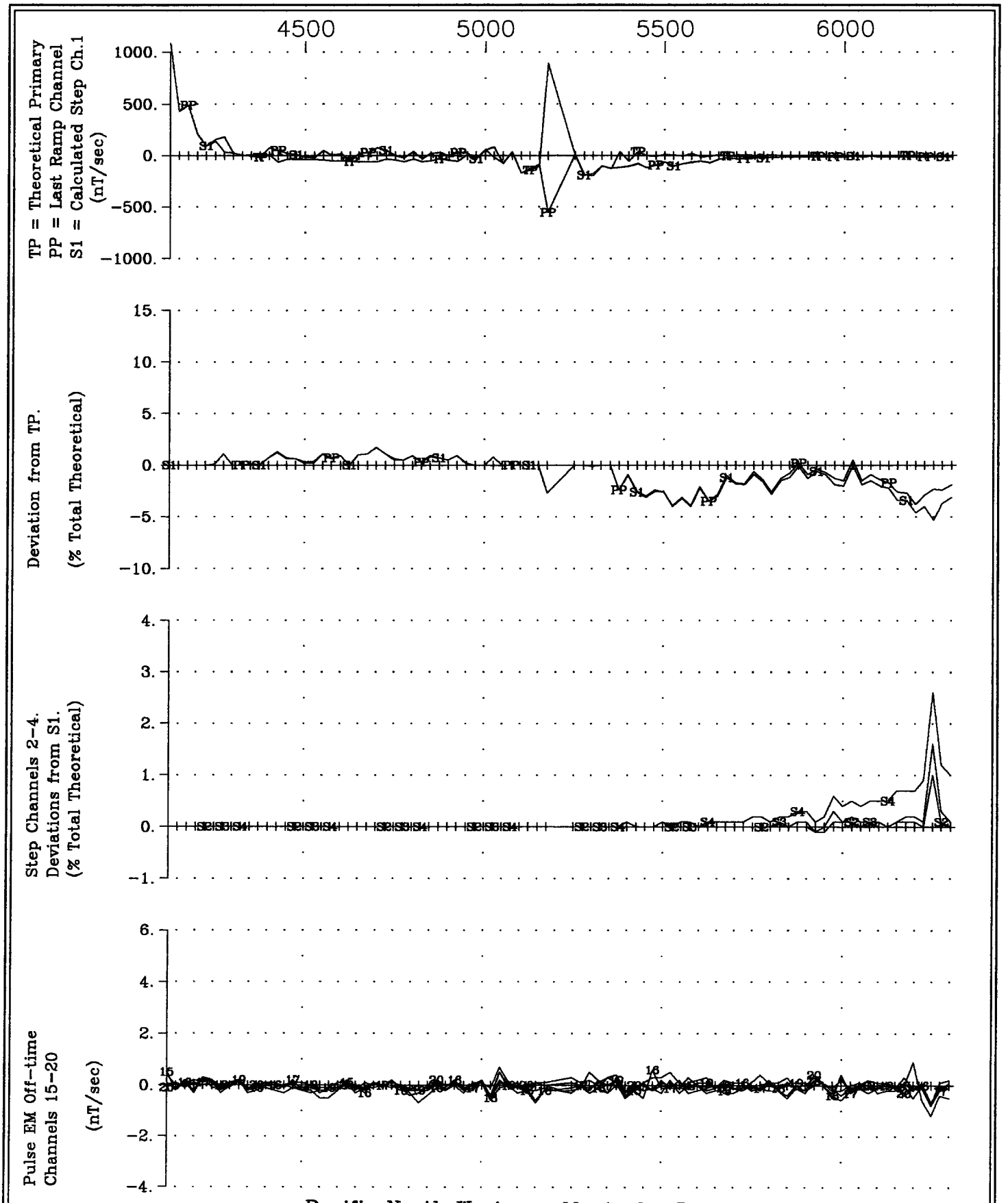

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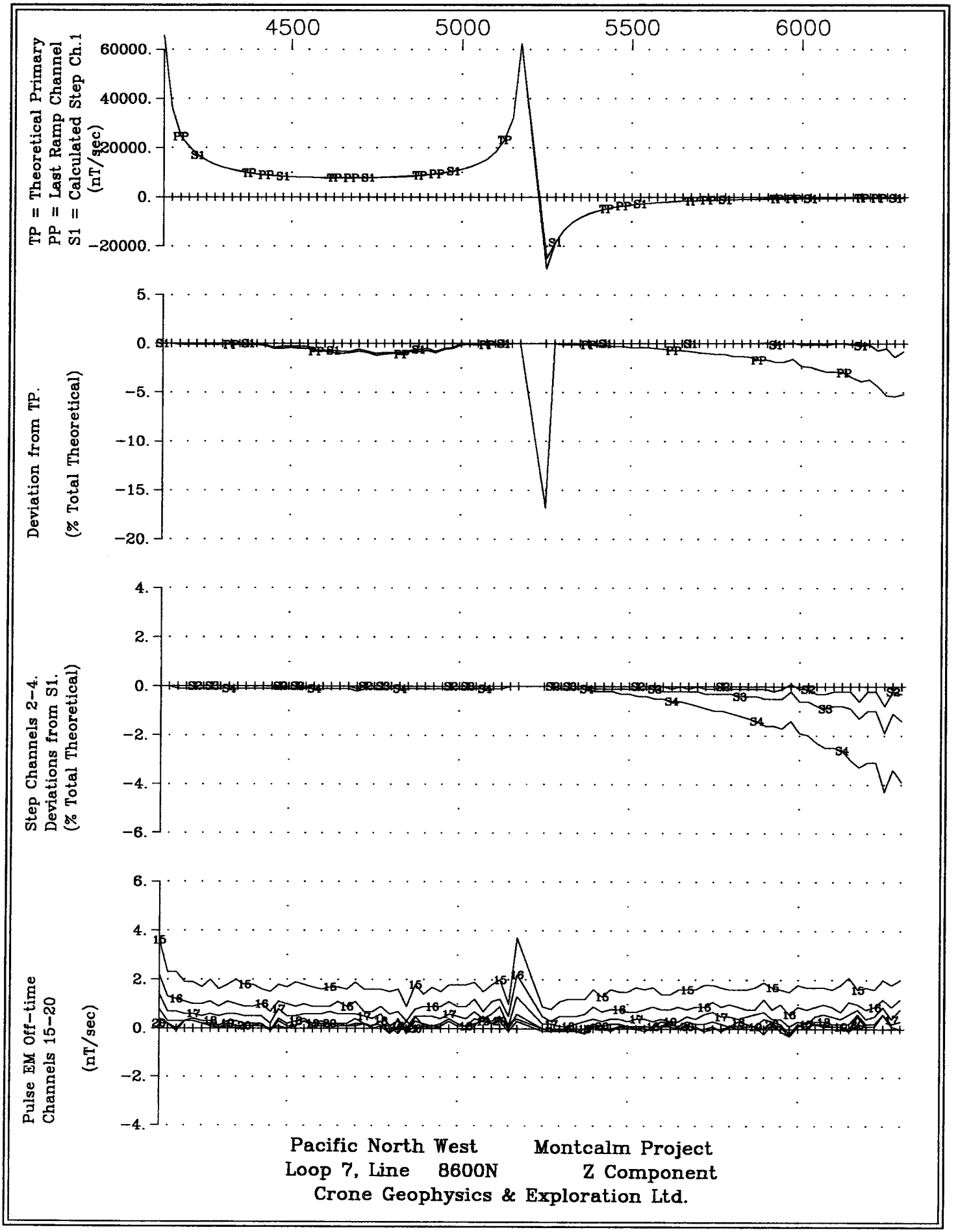
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Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
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-4.
-6.
Pulse EM Off-time
Channels 15-20
(nT/sec)
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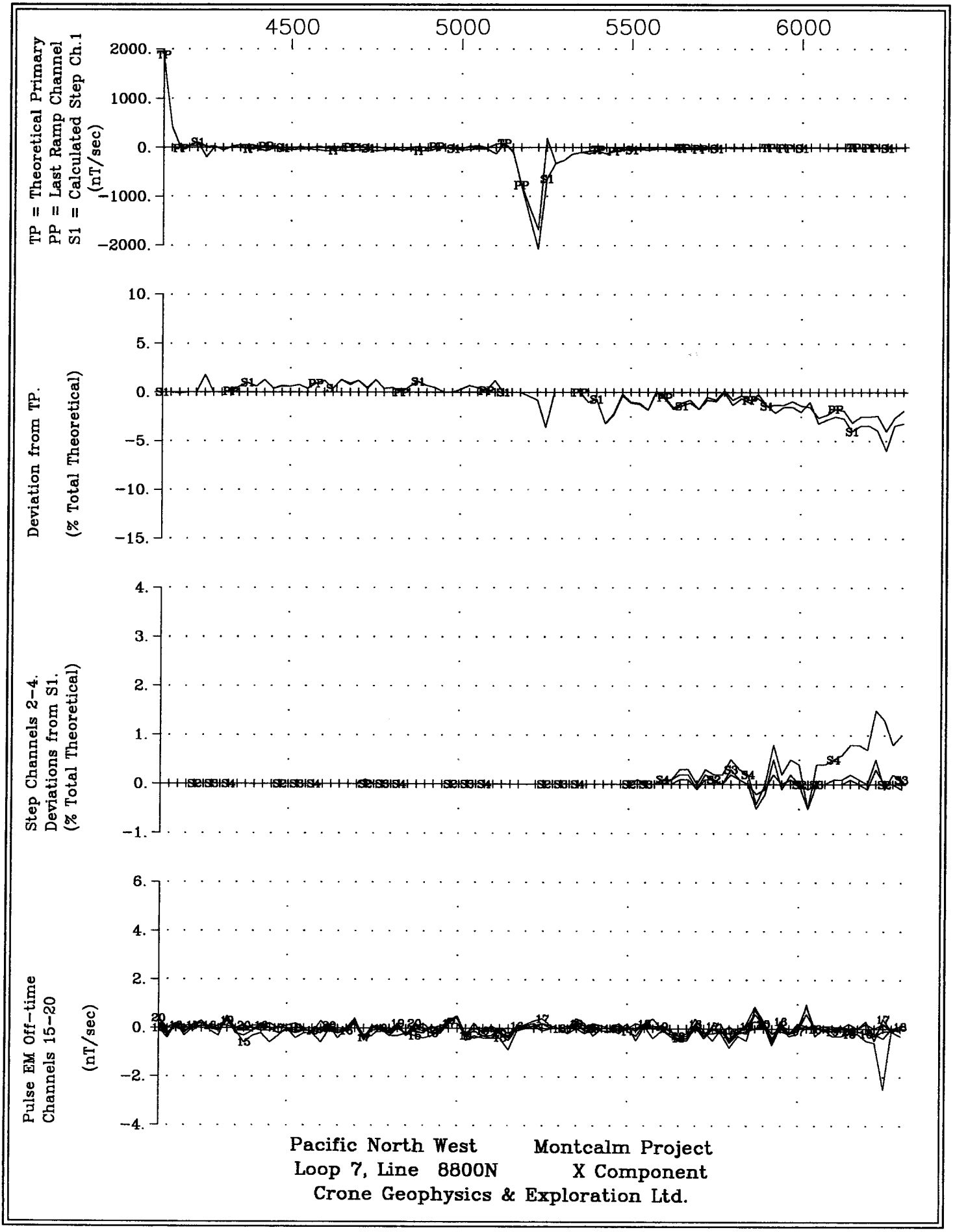

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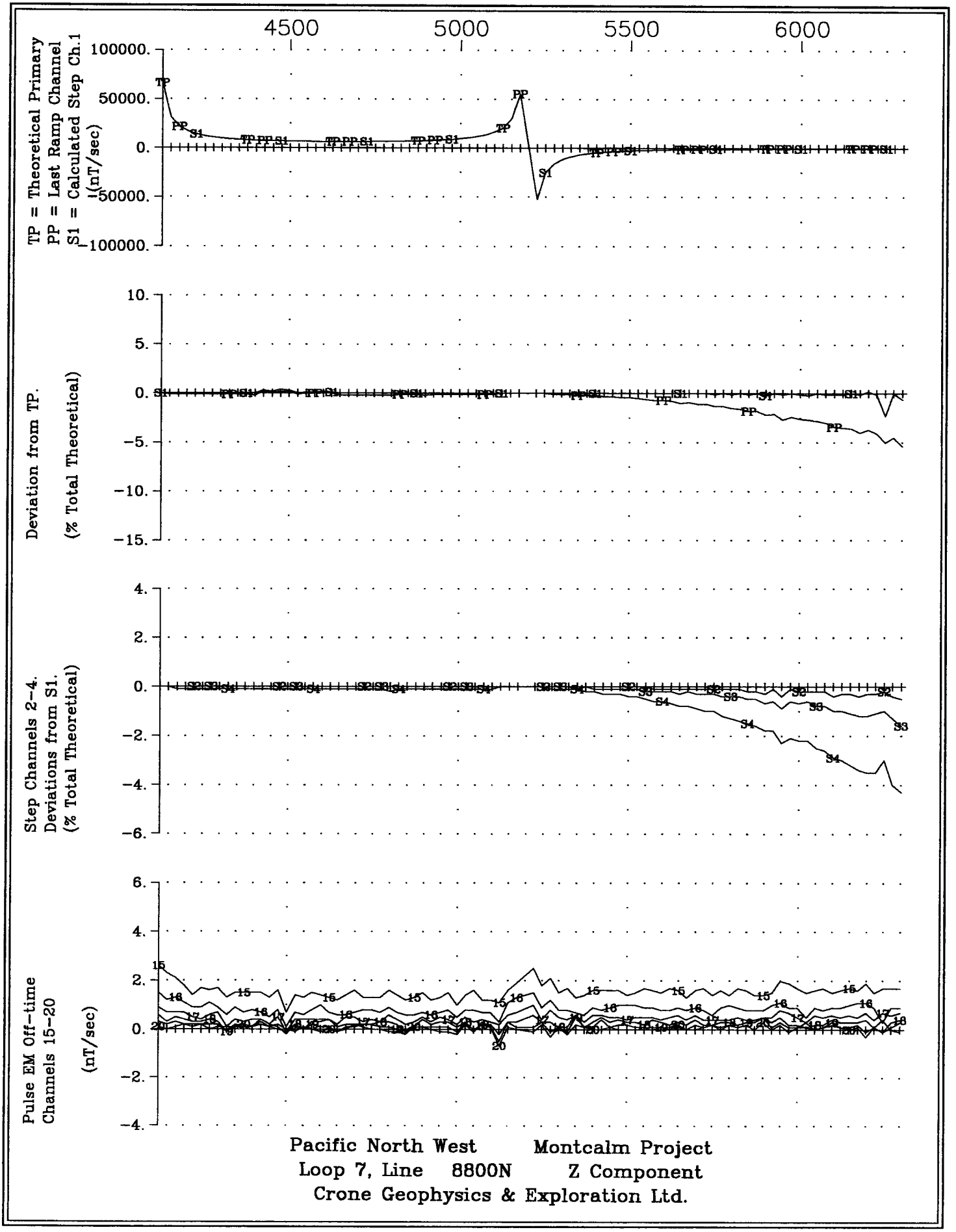

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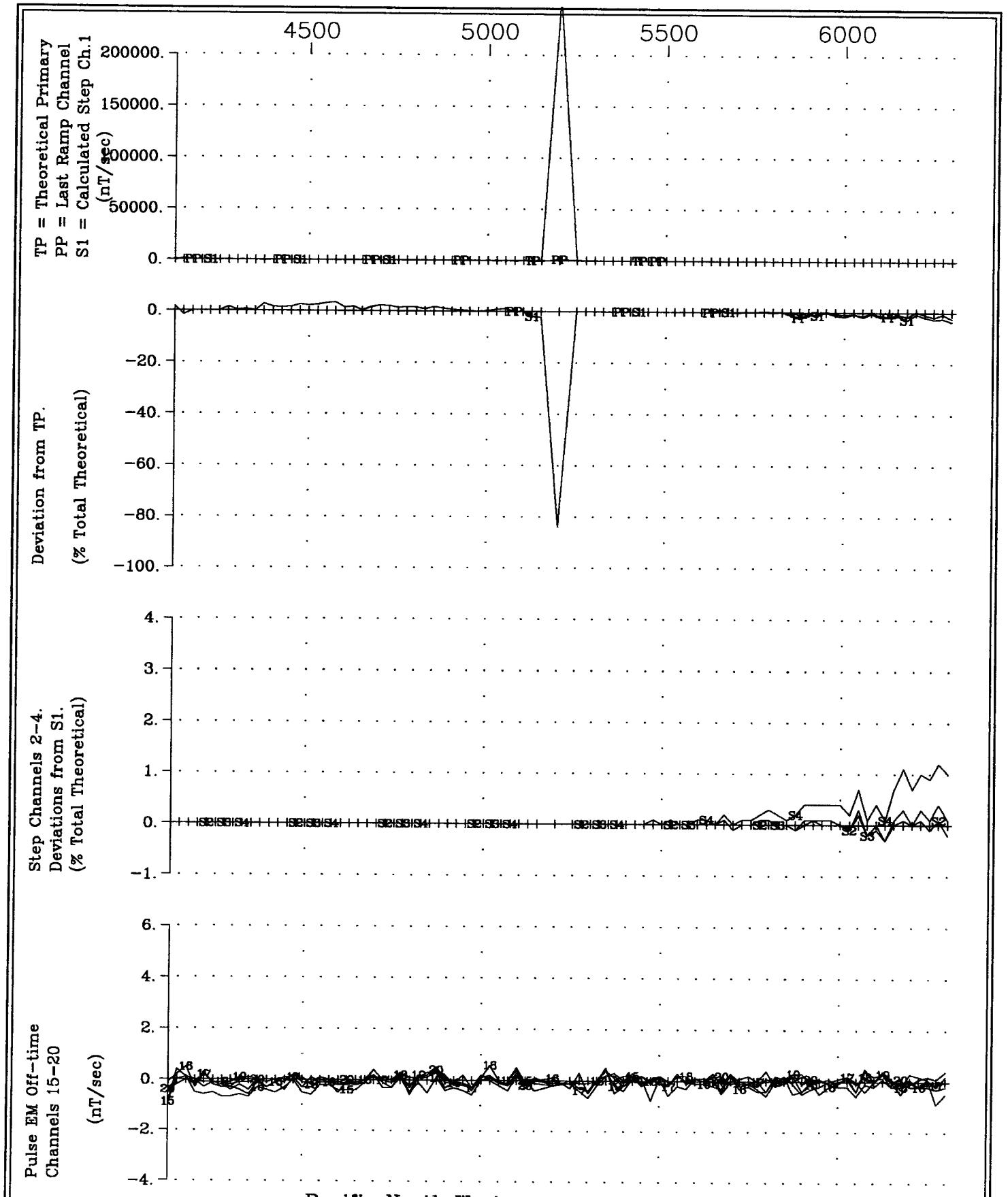

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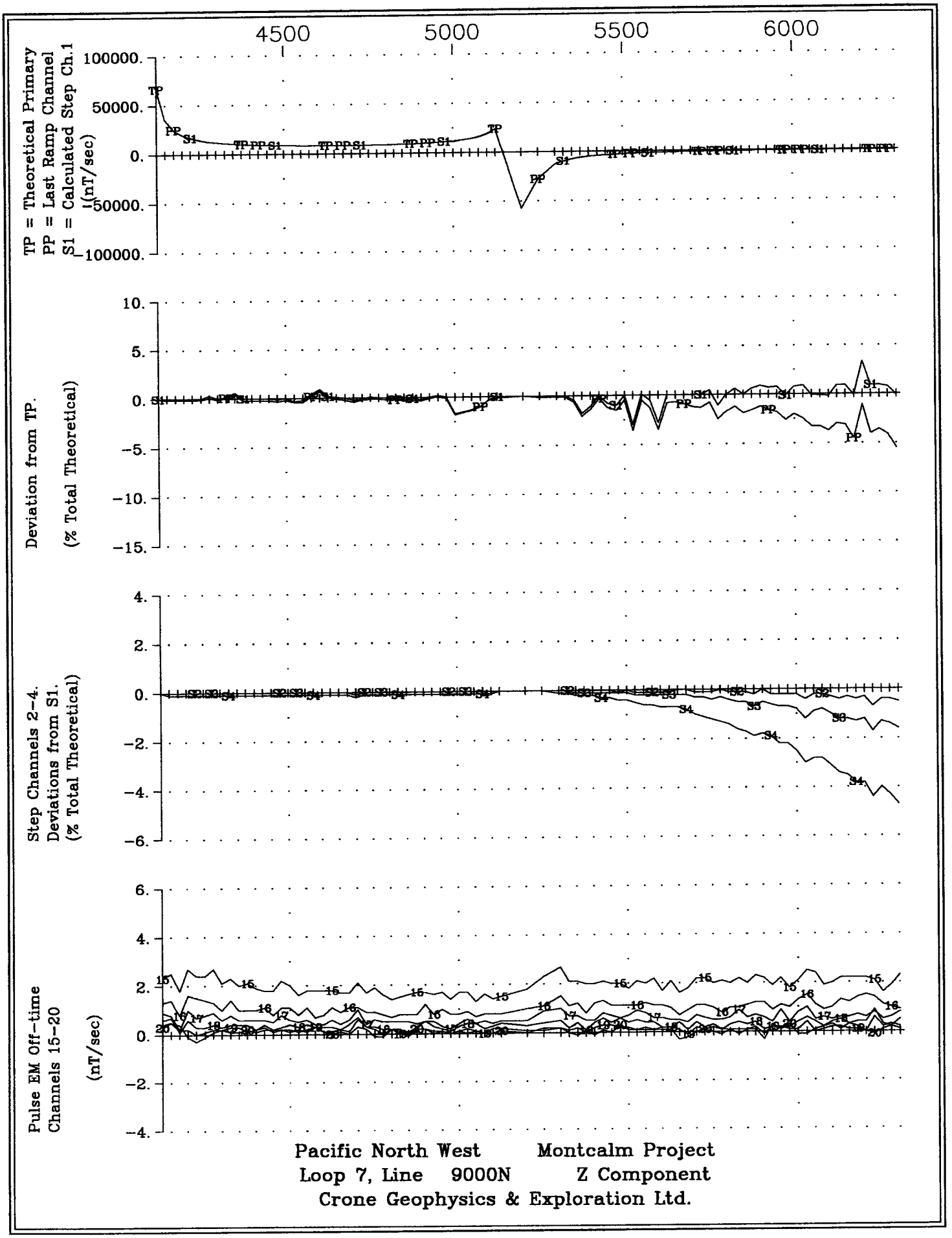

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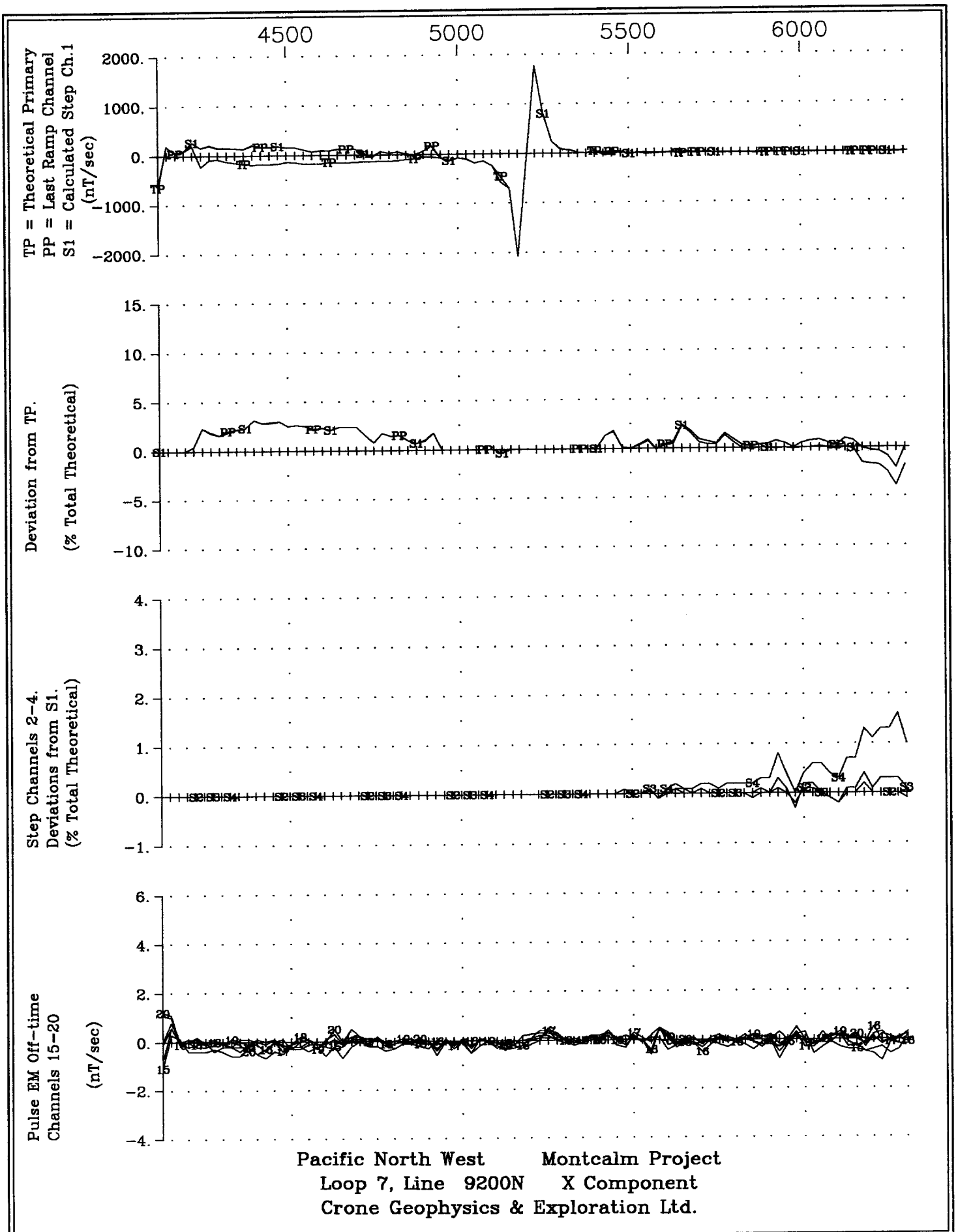

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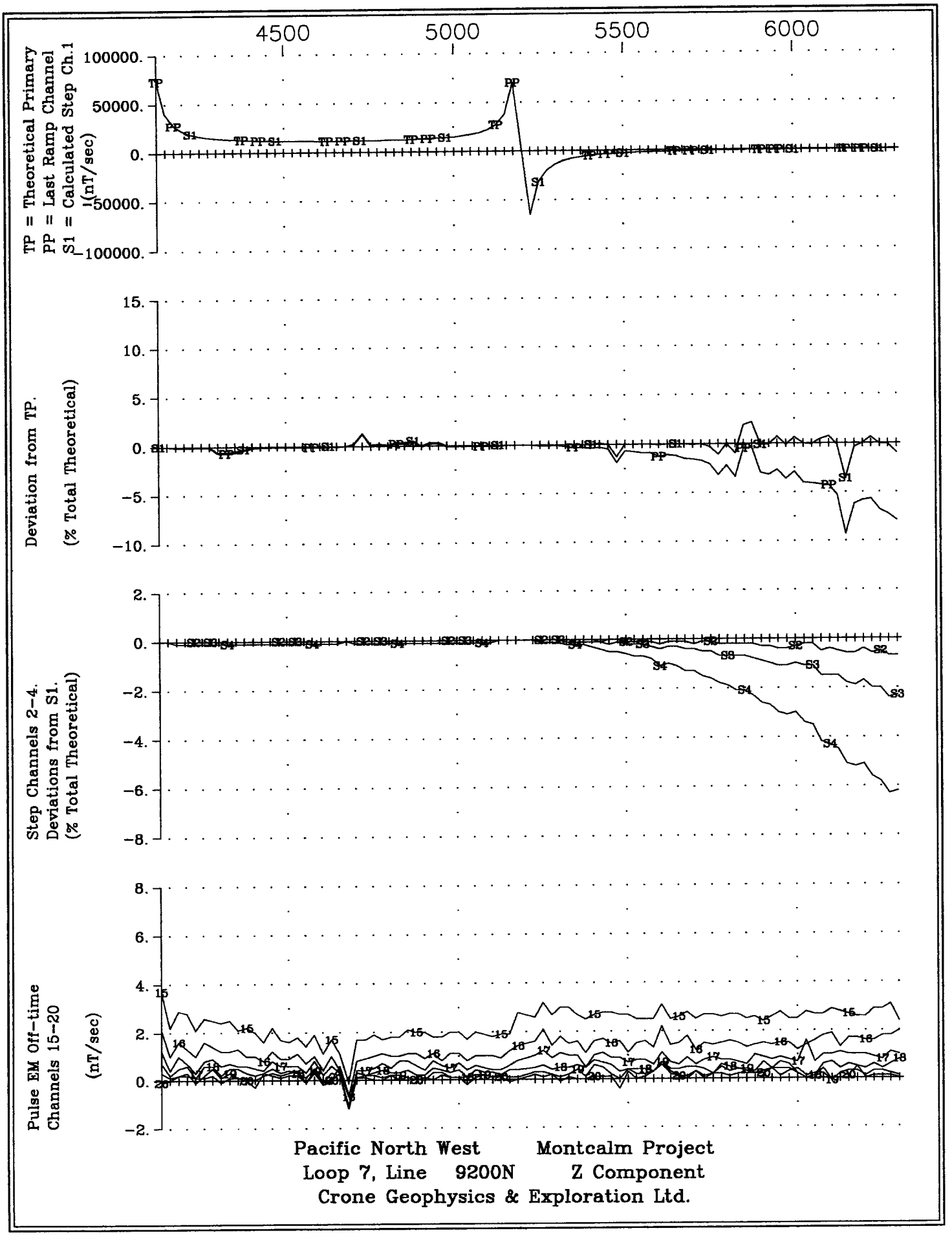
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Deviation from TP.
(% Total Theoretical)
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Step Channels 2-4.
Deviations from S1.
(% Total Theoretical)
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Pulse EM Off-time
Channels 15-20
(nT/sec)
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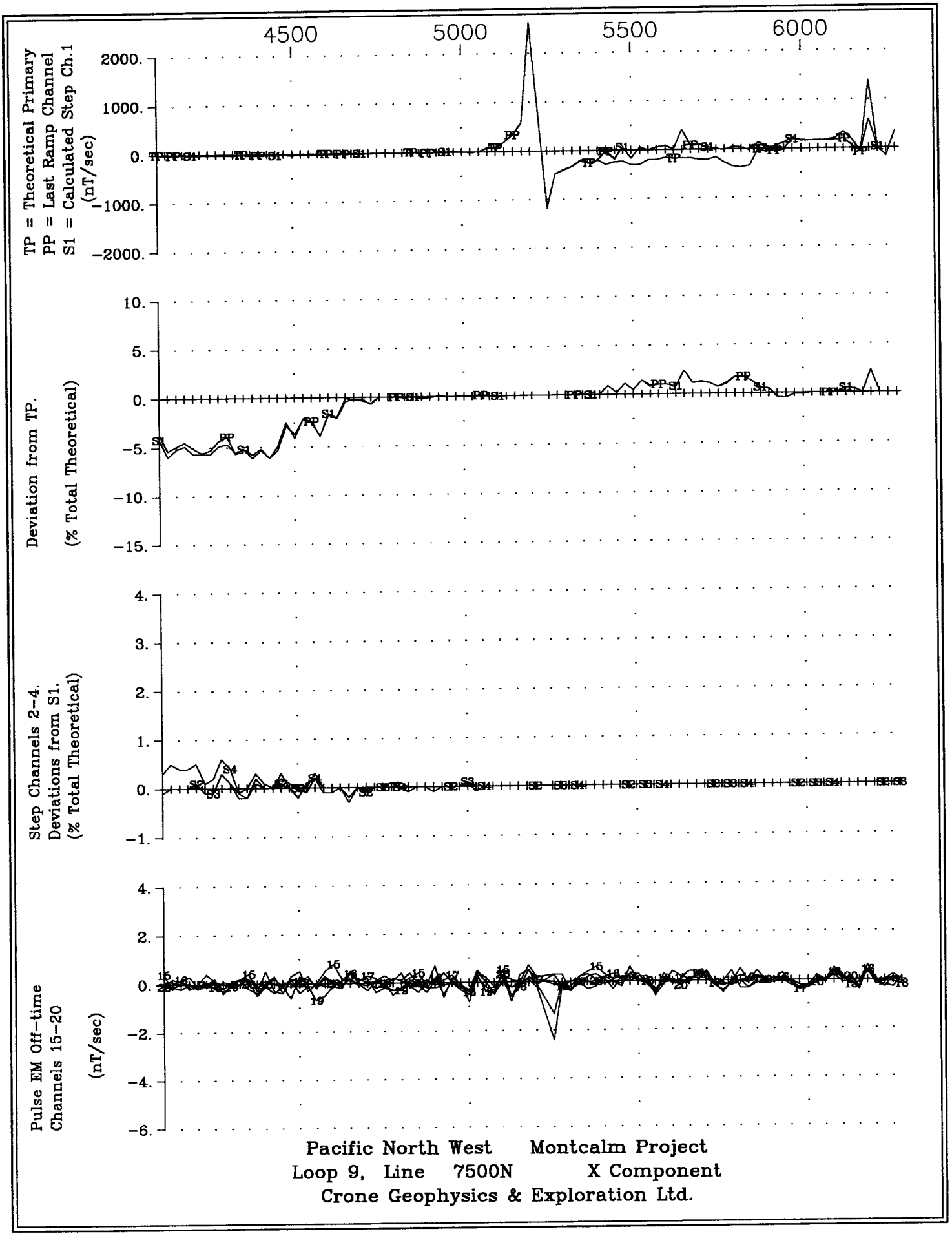

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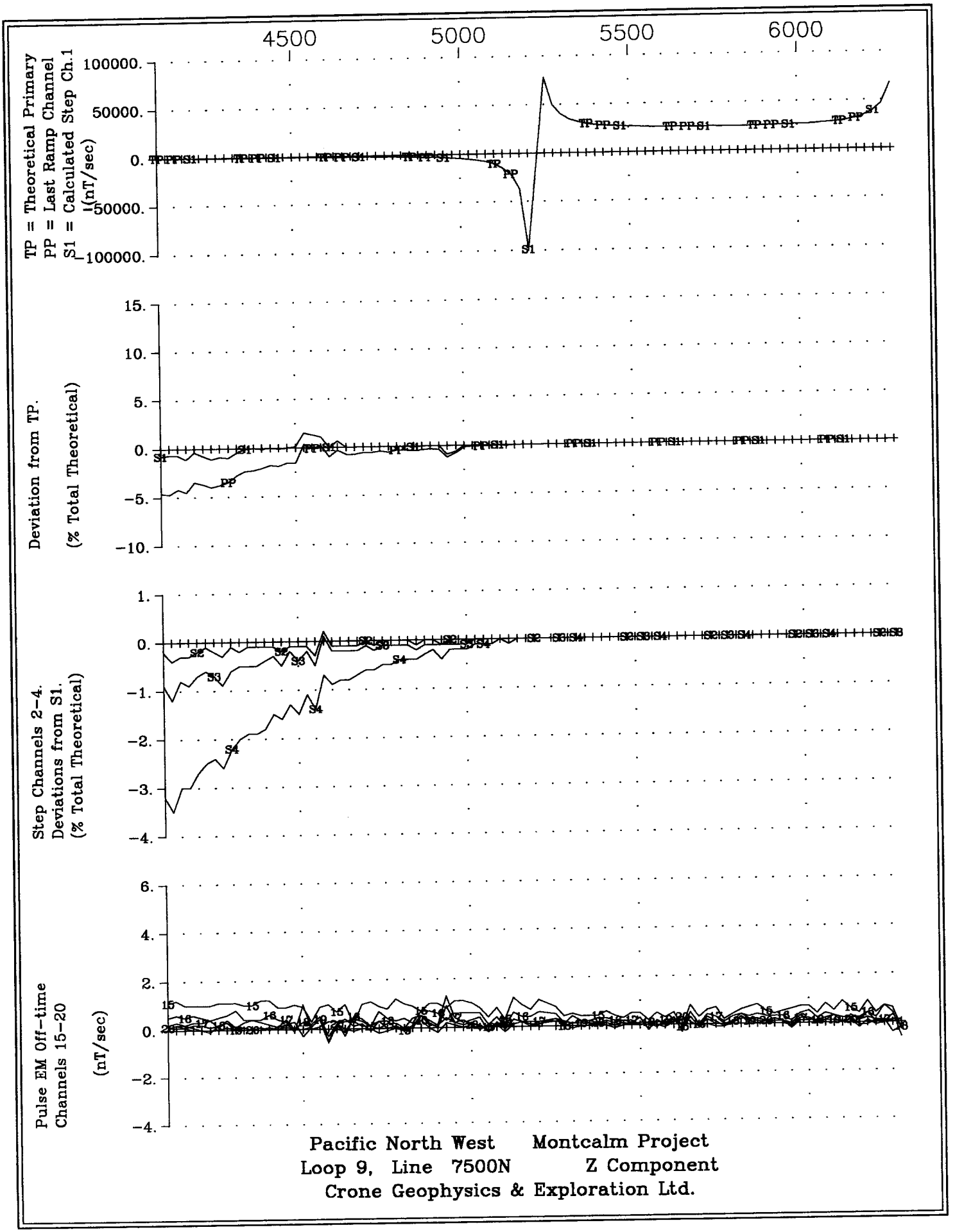

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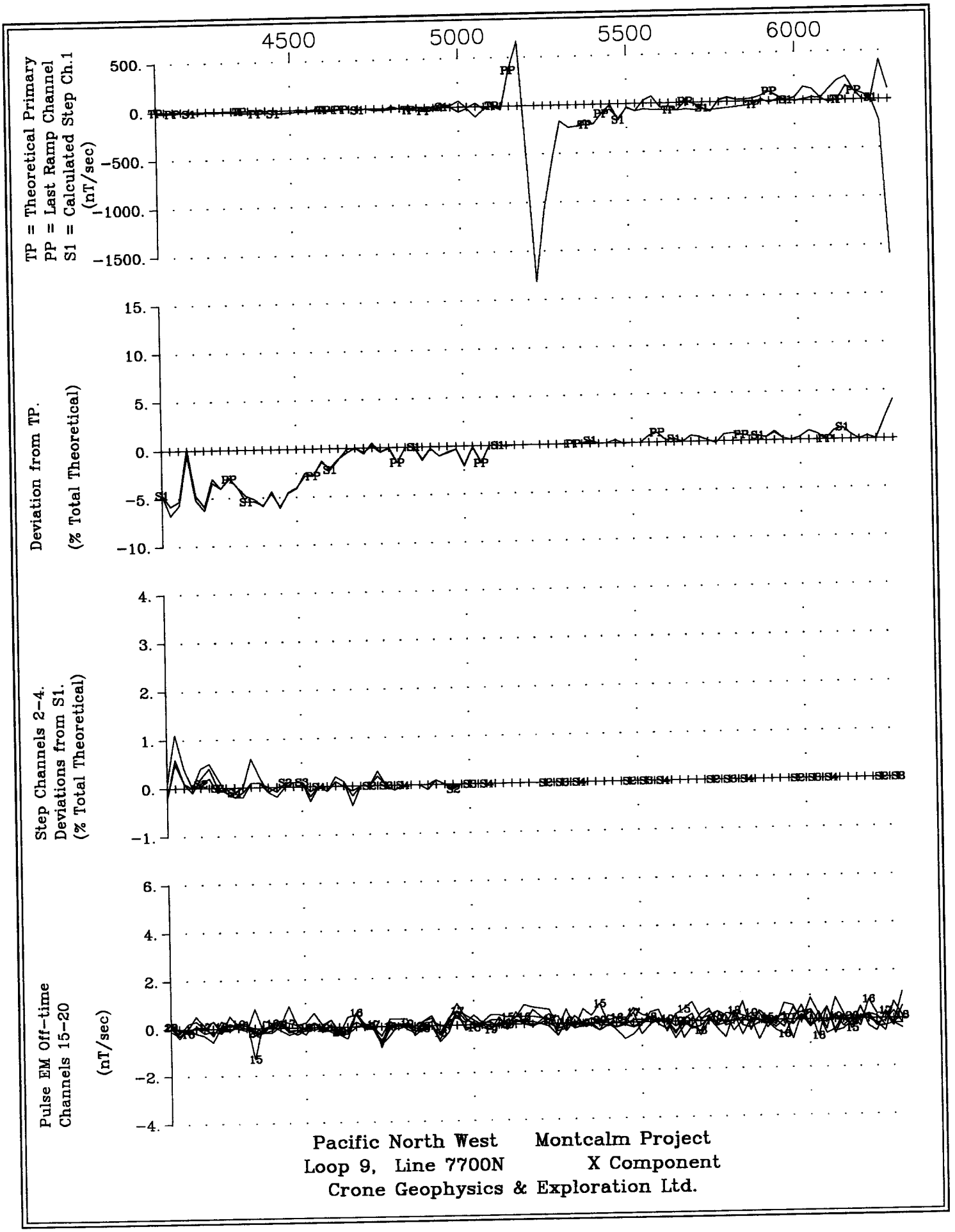

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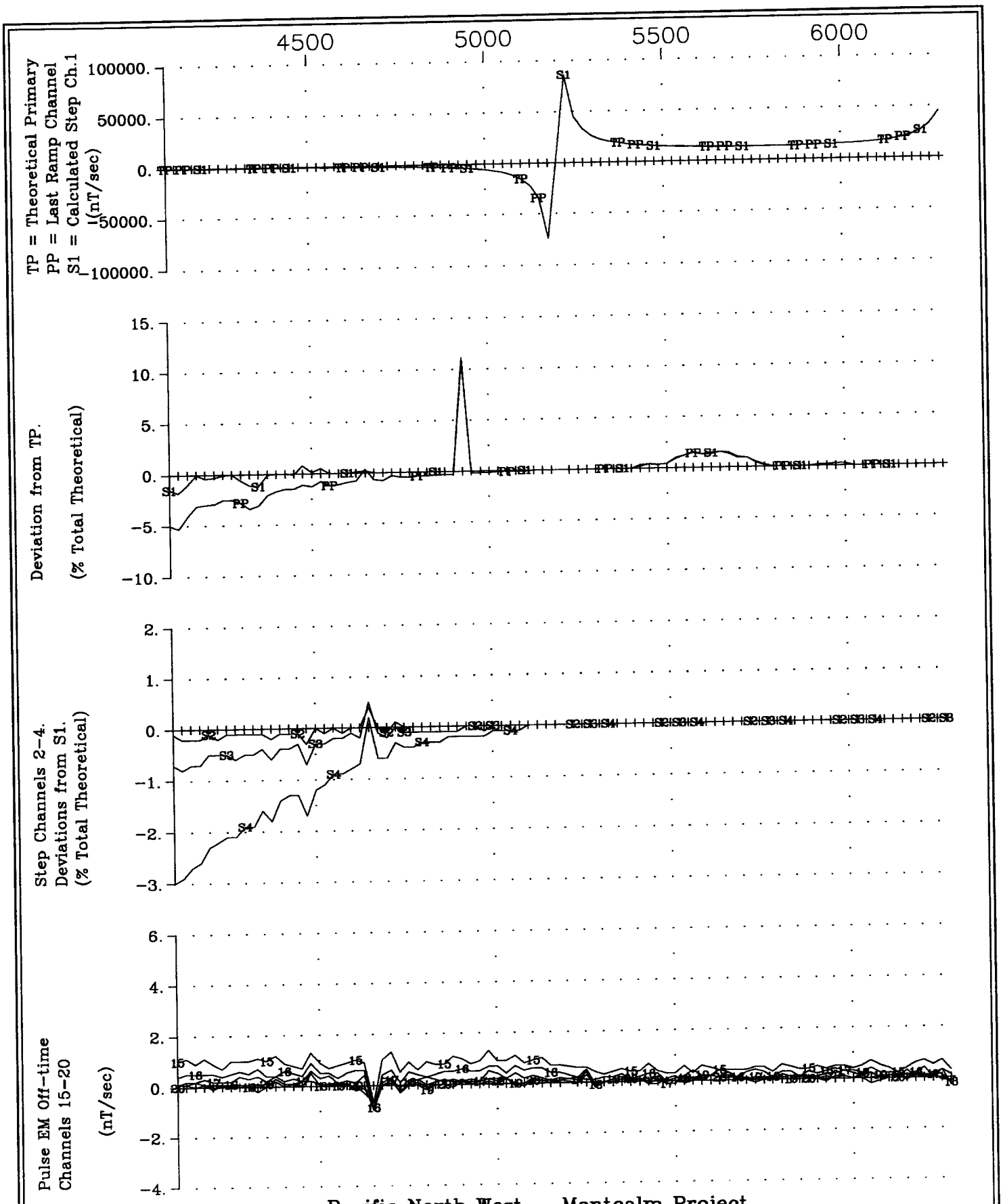

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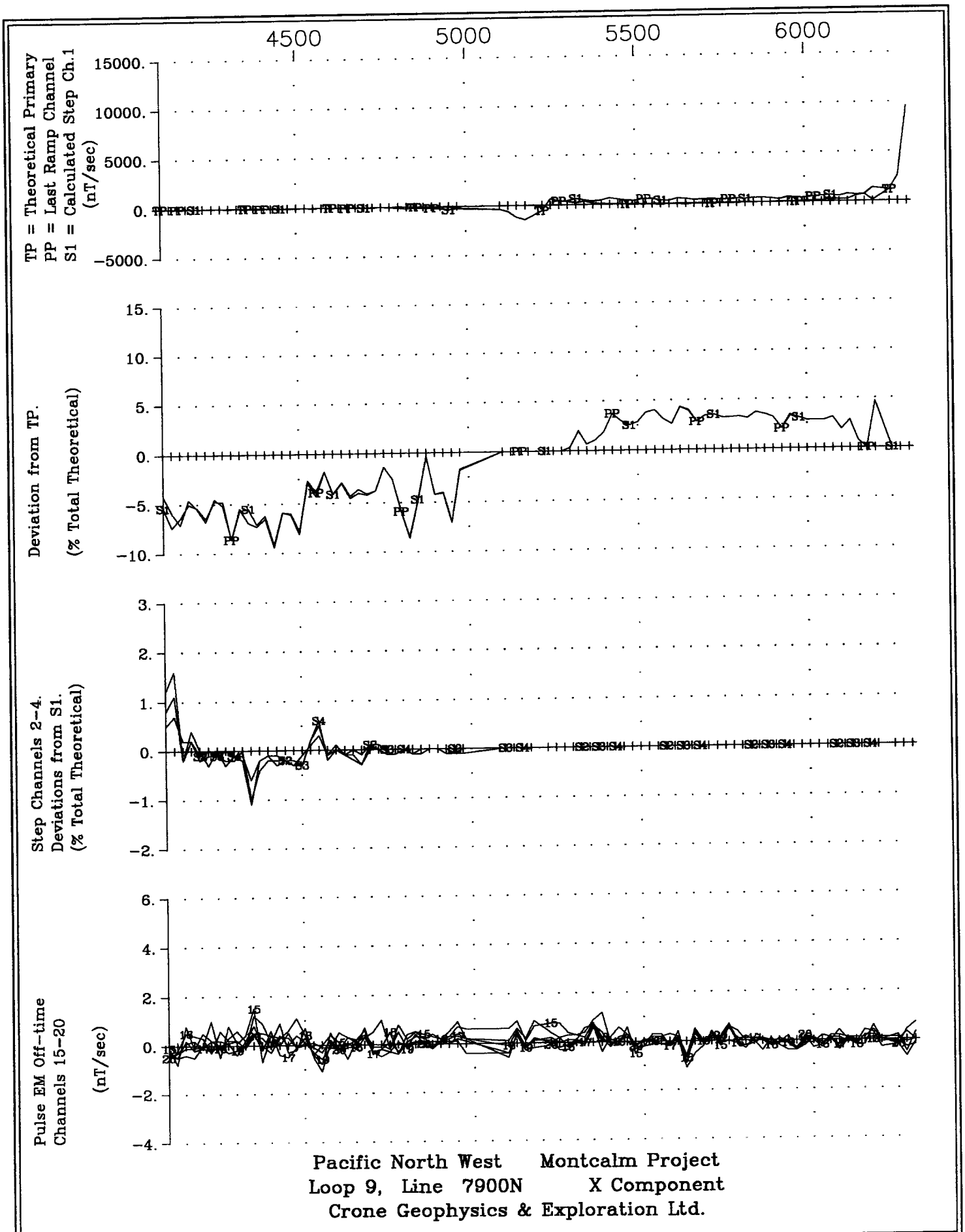

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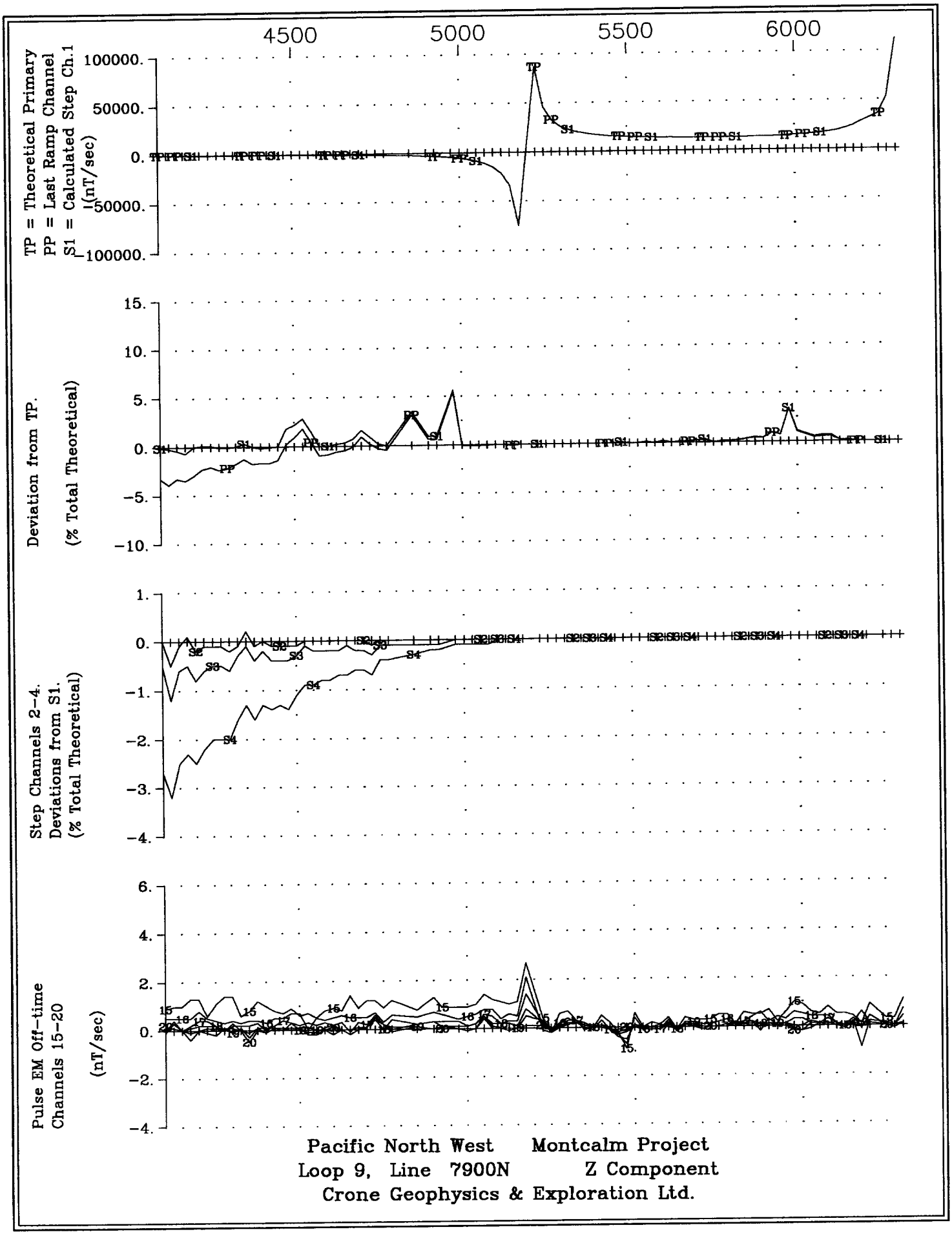

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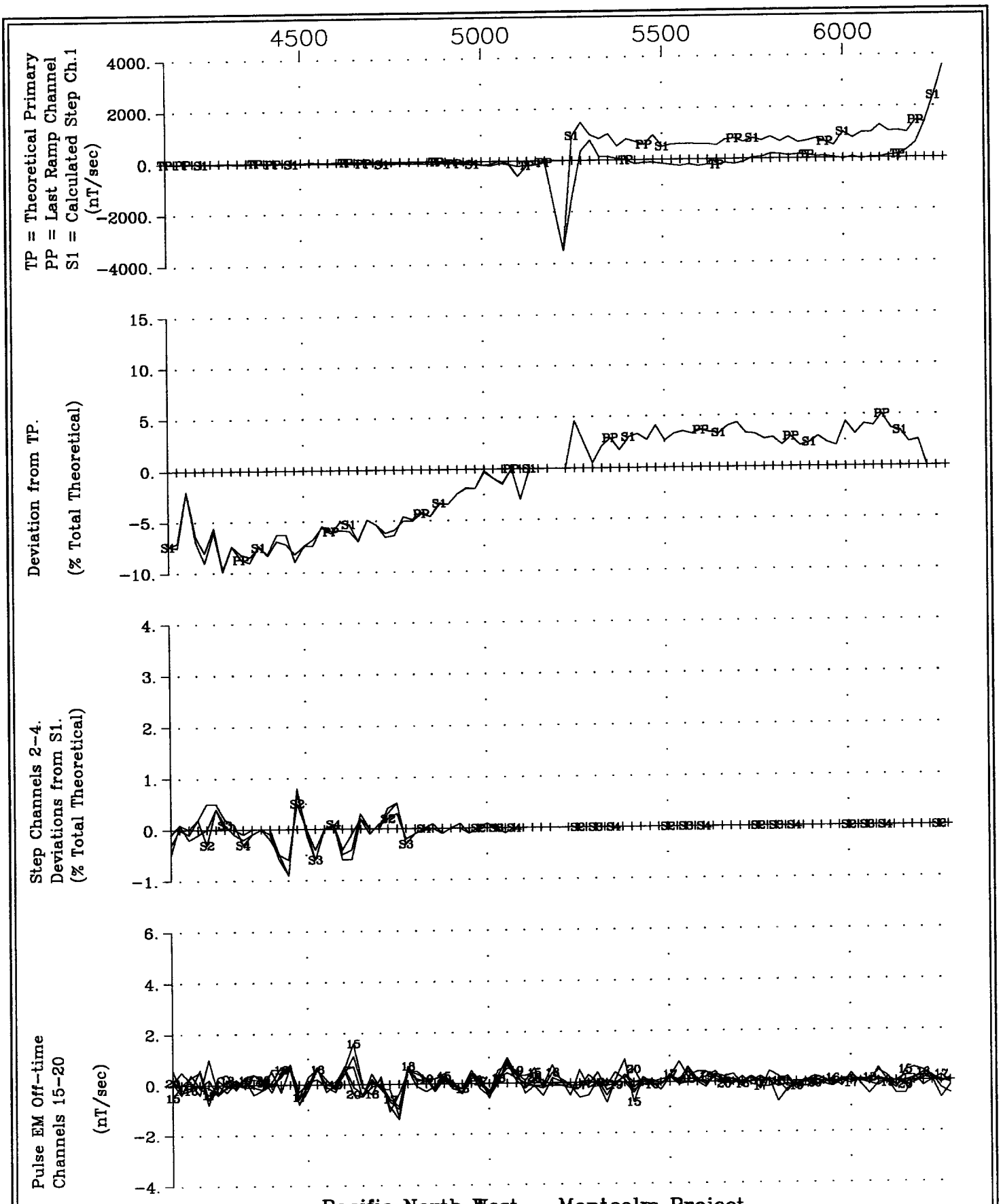

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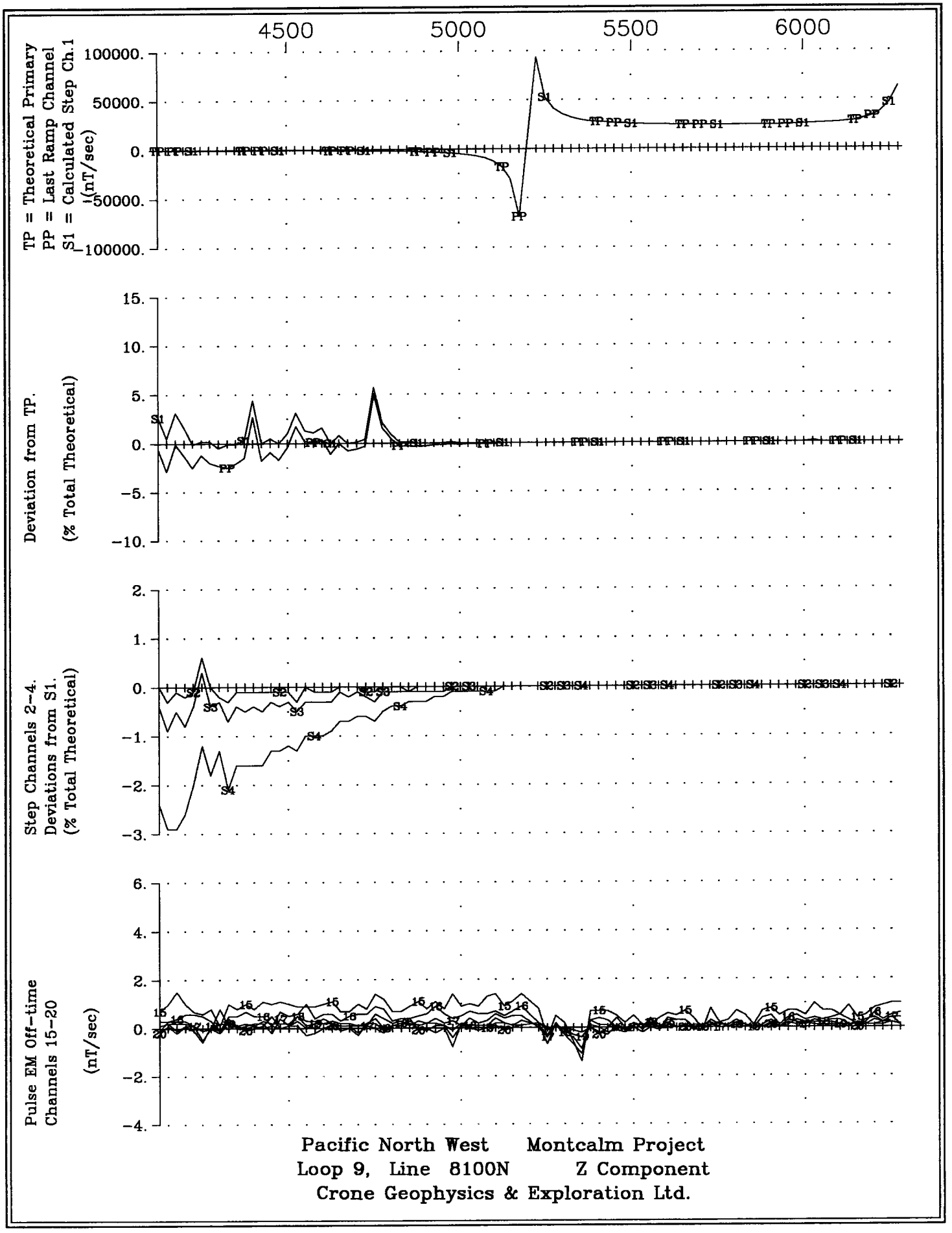


Pacific North West Montcalm Project
Loop 9, Line 8100N Z Component
Crone Geophysics & Exploration Ltd.

APPENDIX IV

CRONE INSTRUMENT SPECIFICATIONS

CRONE PULSE EM SYSTEM

SYSTEM DESCRIPTION

The Crone Pulse EM system is a time domain electromagnetic method (TDEM) that utilizes an alternating pulsed primary current with a controlled shut-off and measures the rate of decay of the induced secondary field across a series of time windows during the off-time. The system uses a transmit loop of any size or shape. A portable power source feeds a transmitter which provides a precise current waveform through the loop. The receiver apparatus is moved along surface lines or down boreholes.

The transmitter cycle consists of slowly increasing the current over a few milliseconds, a constant current, abrupt linear termination of the current, and finally zero current for a selected length of time in milliseconds. The EMF created by the shutting-off of the current induces eddy currents in nearby conductive material thus setting-up a secondary magnetic field. When the primary field is terminated, this magnetic field will decay with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor. The receiver, which is synchronized to the off-time of the transmitter, measures this transient magnetic field where it cuts the surface coil or borehole probe. These readings are across fixed time windows or "channels".

SYSTEM TERMINOLOGY

Ramp Time

"Ramp time" refers to the controlled shut-off of the transmitter current. Three ramp times are selectable by the operator; 0.5ms, 1.0ms, and 1.5ms. By controlling the shut-off rather than having it depend on the loop size and current ensures that the same waveform is maintained for different loops so data can be properly compared.

The 1.5ms ramp is the normally used setting for good conductors. It keeps the early channel responses on scale and decreases the chance of overload. The faster ramp times of 1.0ms and 0.5ms will enhance the early time responses. This can be useful for weak conductors when data from the higher end of the frequency spectrum is desired.

Time Base

Time base is the length of time the transmitter current is off (it includes the ramp time). This also equals the on time of the current. Eight time bases are selectable by the operator. They include the original time bases used in the analog system as well as time bases to eliminate the effects of powerline interference. The eight time bases are as follows: compatible to analog Rx: 10.89ms, 21.79ms; 60hz powerline noise reduction: 8.33ms, 16.66ms, & 33.33ms; 50hz powerline noise reduction: 10.00ms, 20.00ms, & 40.00ms

Since readings are taken during the off cycles, the time base will have an effect on the receiver channels. Normally, a standard time base is selected for the type of system and survey being used, but this can be changed to suit a particular situation. A longer time base is preferred for conductors of greater time constants, and in surveys such as resistive soundings where more channels are desired.

Zero Time Set

The term "zero time set" or "ZTS" refers to the starting point for the receiver channel measurements. It is manually set on the receiver by the operator thus allowing adjustments for the ramp times and fine tuning for any fluctuations in the transmitter signal.

Receiver Channels

The rate of decay of the secondary field is measured across fixed time windows which occupy most of the off-time of the transmitter. These time windows are referred to as "channels". These channels are numbered in sequence with "1" being the earliest. The analog and datalogger receivers measured eight fixed channels. The digital receiver, being under software control, offers more flexibility in the channel positioning, channel width, and number of channels.

PP Channel

The PEM system monitors the primary field by taking a measurement during the current ramp and storing this information in a "PP channel". This means that data can be presented in either normalized or unnormalized formats, and additional information is available during interpretation. The PP channel data can provide useful diagnostic information and helps avoid critical errors in field polarity.

Synchronization

Since the PEM system measures the secondary field in the absence of the primary field, the receiver must be in "sync" with the transmitter to read during the off-time. There are three synchronization methods available: cable connection, radio telemetry, and crystal clock. This flexibility enhances the operational capabilities of the system.

SURVEY METHODS

The wide frequency spectrum of data produced by a Pulse EM survey can be used to provide structural geological information as well as the direct detection of conductive or conductive associated ore deposits. The various types of survey methods, from surface and borehole, have greatly improved the chances of success in deep exploration programs. There are eight basic profiling methods as well as a resistivity sounding mode.

Moving Coil

A small, multi-turn transmitter loop (13.7m diameter) is moved for each reading while the receiver remains a fixed distance away. This method is ideal for quick reconnaissance in areas of high background conductivity.

Moving Loop

Same as Moving Coil method, but with a larger transmit loop (100 to 300 meters square). This method provides deeper penetration in areas of high background conductivity, and works best for near-vertical conductors. This method can be used in conjunction with the Moving In-loop survey for increased sensitivity to horizontal conductors.

Moving In-Loop

A transmit loop of size 100 to 300 meters square is moved for each reading while the receiver remains at the center of the loop. This method provides deep penetration in areas of very high background conductivity, and works best for near-horizontal conductors. It can be used in conjunction with the Moving Loop survey.

Large In-Loop

A very large, stationary transmit loop (800m square or more) is used, and survey lines are run inside the loop. This mode provides very deep penetration (700m or more) and couples best with shallow dip conductors (<45 deg.) under the loop.

Deepem

A large, stationary transmit loop is used, and survey lines are run outside the loop. This mode provides very deep penetration, and couples best with steeply dipping conductors (>45 deg.) outside the loop.

Borehole (Z Component only)

Isolated Borehole: A drill hole is surveyed by lowering a probe down a hole and surveying it with a number of transmit loops laid out on surface. The data from multiple loops gives directional information on the conductors.

Multiple Boreholes: One large transmit loop is used to survey a number of closely spaced holes. The change in anomaly from hole to hole provides directional information.

These methods have detected conductors to depths of 2500m from surface and up to 200m from the hole.

3-D Borehole

Drill holes are surveyed with both the Z and the XY borehole probes. The X and Y components provide accurate direction information using just one transmit loop.

Since the probe rotates as it moves down the hole a correction is required for the X-Y data. This is accomplished in one of two ways. The standard approach is to use the measurement of the primary field from the "PP" channel, apply a "cleaning" algorithm to remove most of the secondary field contamination, and compare this to theoretical values. The amount of probe rotation is then calculated, and the correction can be made. The second method involves the use of an optional orientation device for the X-Y probe which is produced in co-operation with IFG Corp. This attachment uses dipmeters to calculate the probe rotation.

Underground Borehole

Underground drill holes can be surveyed in any of the above mentioned borehole methods with one or more transmit loops on the surface. Near-horizontal holes can be surveyed using a push-rod system.

Resistivity Soundings

By reading a large number of channels in the centre of a transmit loop it is possible to perform a decay curve analysis giving a best-fit layer earth model using programs such as ARRTI or TEMIX.

EQUIPMENT

Transmit Loops

The PEM system can operate with practically any size of transmit loop, from a multi-turn circular loop 13.7m in diameter, to a 1 or 2 turn loop of any shape up to 1 or 2 kilometers square using standard insulated copper wire of 10 or 12 gauge. The multi-turn loop is made in two sections with screw connectors. The 10 or 12 gauge loop wire comes on spools in either 300m or 400m lengths. The spools can be mounted on packframe winders for laying out or retrieving.

Power Supply

The PEM system normally operates with an input voltage from 24v to 120v. Modifications have recently been made to increase the power to 240 volts. The maximum current is still 20 amps. For low power surveys a 20amp/hr 24v battery can be used. The power supply requires a motor generator and a voltage regulator to control and filter the input voltage to the transmitter.

Specifications: PEM Motor Generator

- 4.5 hp Wisconsin, (2 kw) - 11 hp Honda (4 kw); 4 cycle engine
- belt drive to D.C. alternator
- cable output to regulator

- maximum output: 120v, 20amp (2 kw); 240v, 20amp (4 kw)
- fuse type overload protection

- steel frame
- external gas tank
- unit weight: 33kg (2 kw); 52kg (4 kw)
- optional packframe
- wooden shipping box
- shipping weight: 47kg (2 kw); 80kg (4 kw)

Specifications: PEM Variable Voltage Regulator

- selectable voltage between 24v and 120v or 48v and 240v
- 20amp maximum current
- fuse and internal circuit breaker protection
- cable connections to motor generator and transmitter
- anodized aluminum case
- unit weight 10kg; shipping weight 18kg
- padded wooden shipping box

Transmitter

The transmitter controls the bi-polar on-off waveform and linear current shut-off ramp. The latest 2000w PEM Transmitter has the following specifications:

Specifications: PEM Transmitter

- time bases: 10.89ms, 21.79ms, 8.88ms, 16.66ms, 33.33ms, 10ms, 20ms, 30ms
- ramp times: 0.5ms, 1.0ms, 1.5ms
- operating voltage: 24v to 120v (2 kw); 48v to 240v (4 kw)
- output current: 5amp to 20amp
- monitors for input voltage, output current, shut-off ramp, tx loop continuity, instrument temperature, and overload output current
- automatic shut-off for open loop, high instrument temperature, and overload
- fuse and circuit breaker overload protection
- three sync modes: 1) built-in radio and antenna
  2) cable sync output for direct wire link to receiver or remote radio
  3) connectors for the crystal clock
- anodized aluminum case
- optional packframe
- unit weight 12.5kg; shipping weight 22kg
- padded wooden shipping box

Receiver

The receivers measure the rate of decay of the secondary field across several time channels. Three types of receivers are available with the PEM system: Analog Rx, Datalogger Rx, and Digital Rx. The Analog Rx and Datalogger Rx read eight fixed time channels while the Digital Rx, under software control, offers a variety of channel configurations. The Digital Rx has been used in the field for contract surveys since 1987.

Specifications: Digital PEM Receiver

- operating temperature -40°C to 50°C
- optional packframe
- unit weight 15kg; shipping weight 25.5kg
- padded wooden shipping box

Menu driven operating software system offering the following functions:

- controls channel positions, channel widths, and number of channels
- time bases: 10.89ms, 21.79ms, 8.88ms, 16.66ms, 33.33ms, 10ms, 20ms, and 30ms
- ramp time selection
- sample stacking from 512 to 65536
- scrolling routines for viewing data
- graphic display of decay curve and profile with various plotting options
- routines for memory management
- control of data transmission
- provides information on instrument and operating status

Sync Equipment

There are three modes of synchronization available; radio, cable, and crystal clock. The radio sync signal can be transmitted through a booster antenna from either the PEM Transmitter internal radio or through a Remote Radio.

Specifications: Sync Cable

- 2 conductor, 24awg, Teflon coated
- approx. 900m per aluminum spool with connectors

Specifications: Remote Radio

- operating frequency 27.12mhz
- 12v rechargeable gel cell battery supply
- fuse protection
- sync wire link to transmitter
- coaxial link to booster antenna
- anodized aluminum case
- unit weight 2.7kg

Specifications: Booster Antenna

- 8m, 4 section aluminum mast
- guide rope support
- ¼ wave CB fiberglass antenna
- range up to 2km
- coaxial connection to transmitter or remote radio

Specification: Crystal Clocks

- heat stabilized crystals
- 24v rechargeable gel cell battery supply
- anodized aluminum case
- rx unit can be separate or housed in the receiver
- outlet for external supplementary battery supply

Surface PEM Receive Coil

The Surface PEM Receive Coil picks up the EM field to be measured by the receiver. The coil is mounted on a tripod that can be positioned to take readings of any component of the field.

Specifications: Surface PEM Receive Coil

- ferrite core antenna
- VLF filter
- 10khz bandwidth
- two 9v transistor battery supply
- tripod adjustable to all planes

- unit weight 4.5kg; shipping weight 13.5kg
- padded wooden shipping box

Borehole PEM Z Component Probe

The Z component probe measures the axial component of the EM field. The Z component data is not affected by probe rotation so no correction are required.

Specifications: Borehole PEM Z Component Probe

- ferrite core
- dimensions: length - 1.6m; dia - 3.02cm (3.15cm for high pressure tested probes)
- internal rechargeable ni-cad battery supply
- replaceable heat shrink tubing for abrasion protection
- pressure tested for depths 1300m, 2000m, and 2800m
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total weight 17kg

Borehole PEM XY Component Probe

The XY probe measures two orthogonal components of the EM field perpendicular to the axis of the hole. Correction for probe rotation can be achieved by two methods. The standard approach is to use the measurement of the primary field from the "PP" channel, apply a "cleaning" algorithm to remove most of the secondary field contamination, and compare this to theoretical values. The amount of probe rotation is then calculated, and the correction can be made. The second method involves the use of an optional orientation device for the X-Y probe that uses dipmeters to calculate the probe rotation.

Specifications: Borehole PEM XY Component Probe

- ferrite core
- dimensions: length - 2.01m; dia - 3.02cm
- internal rechargeable ni-cad battery supply
- selection of X or Y coils by means of a switch box on surface or automatic switching with Digital receiver
- replaceable heat shrink tubing for abrasion protection
- pressure tested for depths to 2800m
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total shipping weight 20kg

Orientation Device

The orientation device is an optional attachment for the XY probe which measures the rotation of the probe using two dipmeters.

Specifications: Orientation Device

- 2 axis tilt sensors
- sensitivity +/- 0.1 deg.
- operating range -89.5 to -10 deg.
- dimensions: length - 0.94m; dia - 28.5cm
- packaged in padded cover and aluminum tube
- shipped in padded wooden box; total shipping weight 11kg

Borehole Equipment

To lower the probe down a drill hole requires a cable and spool, winch assembly frame and cable counter. Borehole surveys also require equipment to "dummy probe" the hole before doing the survey.

Specifications: Borehole Cable

- two conductor shielded cable
- kevlar strengthened
- lengths are available up to 2600m on three sizes of spools.
- shipped in wooden box

Specifications: Slip Ring

- attaches to side of borehole cable spool providing a connection to the receiver while allowing the spool to turn.
- VLF filter
- pure silver contacts

Specifications: Borehole Frame

- welded aluminum frame
- removable axle
- chain driven, 3 speed gear box
- hand or optional power winding
- hand brake and lock
- two sizes: standard for up to 1300m cable; larger for longer cables
- shipped in wooden box

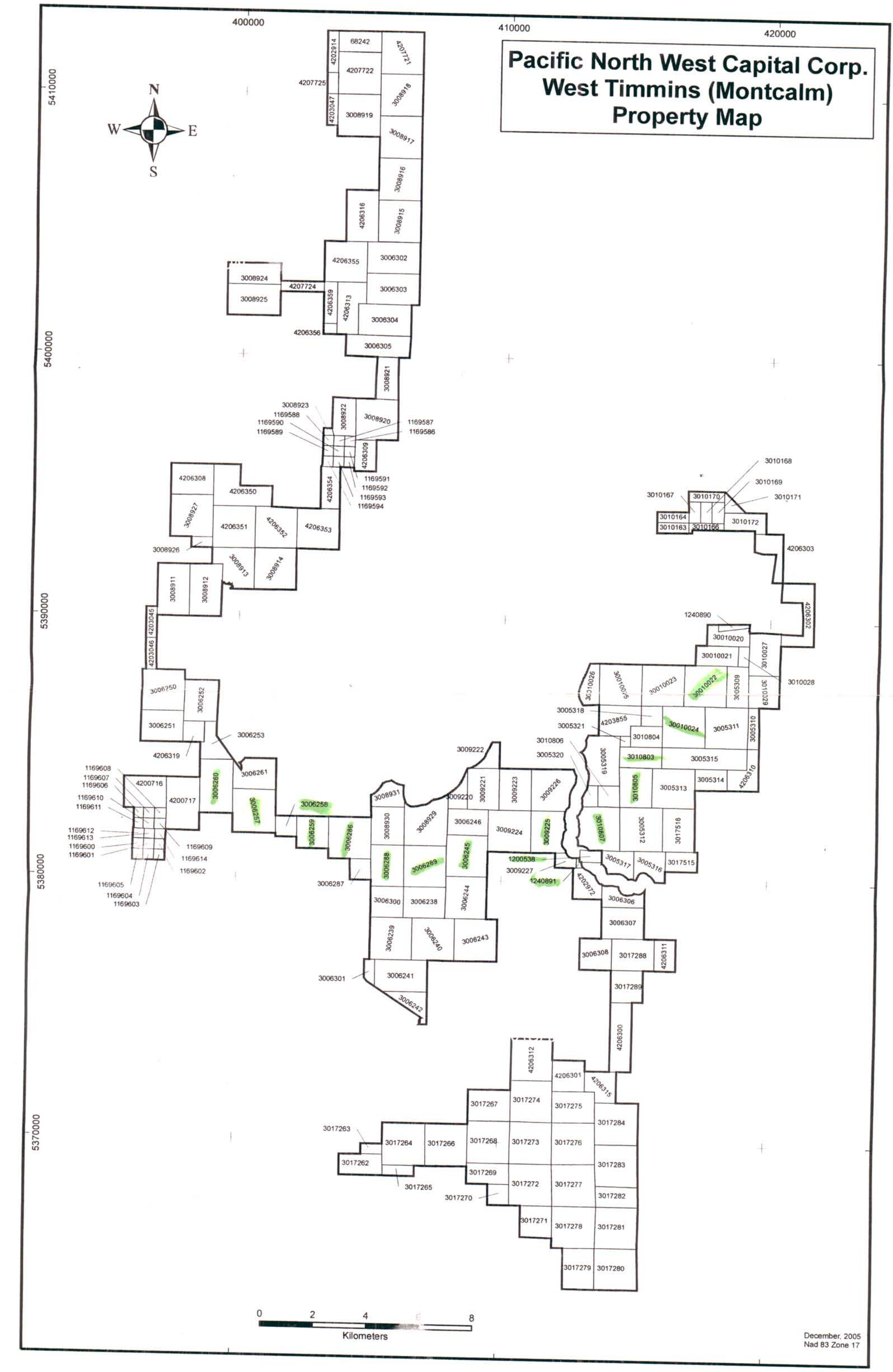
Specifications: Borehole Counter

- attaches to the drill hole casing
- calibrated in meters
- shipped in wooden box; total weight 13kg

Specifications: Dummy Probe and Cable

- solid steel or steel pipe
- same dimensions as borehole probe
- shear pin connection to dummy cable
- steel dummy cable on aluminum spool
- cable mounts on borehole frame
- various lengths to 2600m on 3 spool sizes.

Pacific North West Capital Corp.
West Timmins (Montcalm)
Property Map



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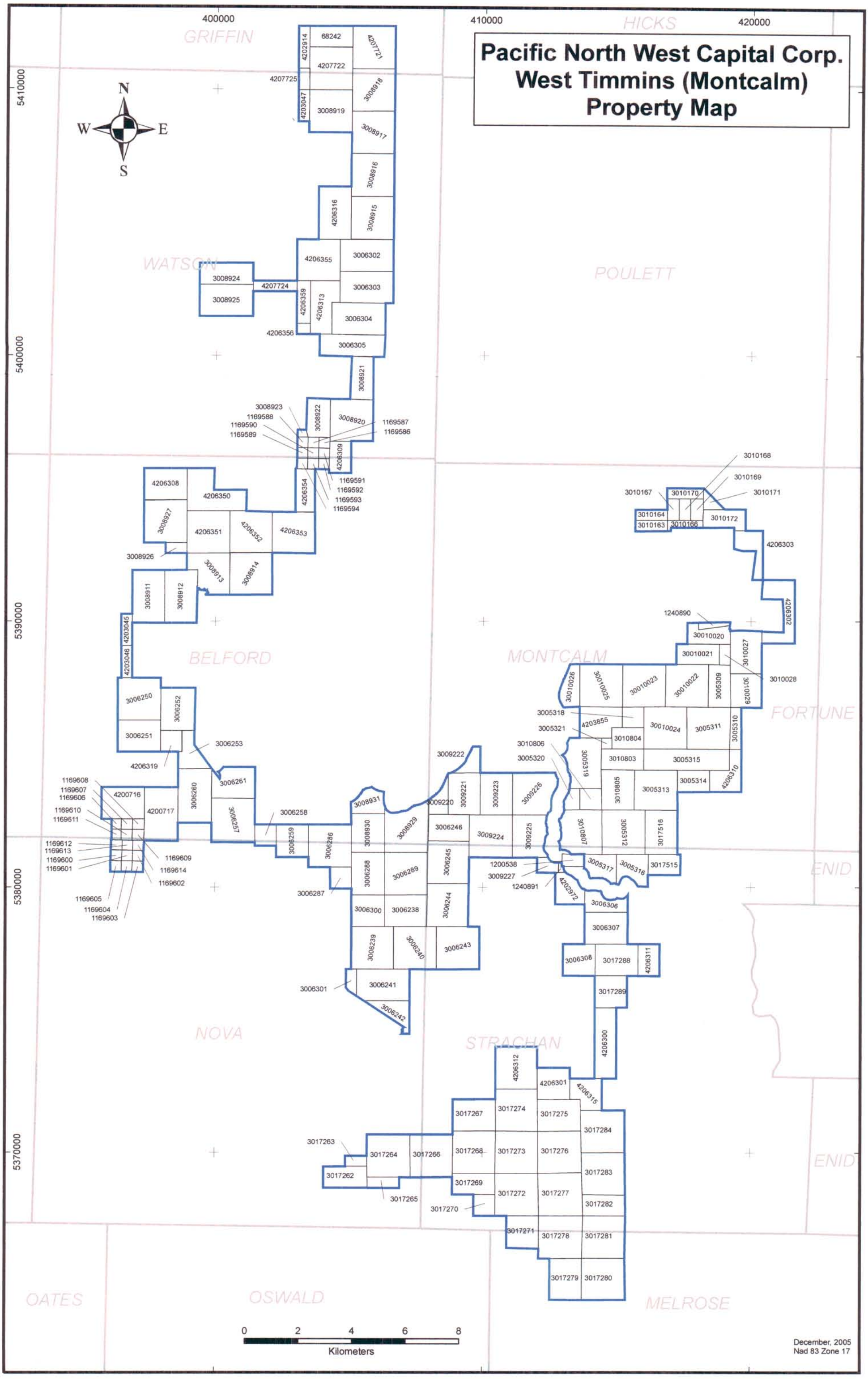

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