CHAPER 3 GEOPHYSICAL SURVEY

3-1 General Description of Survey

Fugro Airborne Surveys Pty. Ltd. conducted airborne magnetic and radiometric surveys in two areas, i.e., Area 1 and Area 2 of the Western Erdenet area from October to December 2001.
The objective of this survey is to select zones for mineral development by clarifying the geological structure of Western Erdenet area.

3-2 Description of Survey

Airborne magnetic and radiometric survey were conducted according to the following specifications:

a. Fixed Wing Aircraft (Piper Cheyenne PA-31T2)

b. Survey Line: north – south direction: 250m interval.
Tie-line: 2,500m interval

c. Nominal flight altitude of aircraft: 120m

d. Ground magnetometer
Ground magnetometer was set up to the east of an airport for monitoring the daily changes of total magnetic field.

e. Geophysical equipment

Geometrics G822A opticaly pumped cesium sensor tail stringer configuration
2 x Exploranium GR820 16.7 Littre Radiometrics Crystals

During the survey, the following data was recorded on disk and copied in magnetic tapes:

Real time
Radar Altitude
Barometric Altitude
Magnetometer Reading (unconpensated)
Magnetometer Reading (Conpensated)
Position WGS-84 latitude (from navigation system)
Position WGS-84 longitude (from navigation system)
3 axes fluxgate magnetometer information
Flight number, line number and, at appropriate times

3-3 Field Survey

Base station was located at Bulga airport.

Data acquisition was conducted from 3rd October to 4th December 2001.

Survey quantity is as follows:

Area Name	Line Numbers	Flight Length (Line-km)
Area 1	Survey Line: 295	21,281 km
	Tie Line: 30	
Area 2	Survey Lines: 210	4,209 km
	Tie Lines: 8	
Total Length (Line-km)		26,538 km

Survey equipment is shown in Table 3-1-2.

3-4 Data Processing and Analysis

The collected magnetic data went through a correction process and then the data was gridded by using grids of 50m intervals. The gridded results were further processed to elaborate counter maps and shadow maps showing the geographical coordinates in UTM and Latitude and Longitude. These results together with the geological survey result were combined to get a more solid geological interpretation.

The interpretation was focused on tectonical and structural elements by taking also into consideration the geological interpretation of Landsat.

3-4-1 Magnetics survey

(1) Data editing and compensation

After each flight, all records were inspected to assess the noise level of the recorded total magnetic field, focusing on the fourth difference reading generated from the magnetic data and displayed on charts. Editing all recorded parameters for spikes or datum shifts were conducted by using a combination of first, second and fourth difference routines.

After checking and calibration of the aircraft magnetometer system, the survey started by doing flight tests at high altitude over a magnetically quiet area for several minutes in each of the 4 survey starting lines. During this period the aircraft performs pitch, roll and yaw manoeuvres. The output of 3 axes fluxgate magnetometer and appropriate data acquisition/compensation system software was used to calculate the compensation coefficients. The effect of these manoeuvres on the compensated

Table II-3-1 Specification of Airborne geophysical survey instruments

Name	Model	Manufacturer(Contry)	Specifications
Aircraft	Piper Cheyenne PA-31T2		Enginex2, Range:6hrs,1470 n.m., Rate of Climb:2250 ft/min Crusing speed: 245 Knots, Raw FOM: 12.0nT, Compensation FOM: 1.0nT
Magnetmeter Optically pumped cesium sensor	G-822A	Geometrics(Canada)	Dynamic range:20,000-95,000nT Sensitivity:±0.001nT, Sampling Rate:up to 100Hz Noize Level:Less than 0.01nT Gradient Tolerance: 50,000nT/m Sensor orientation: ±10deg
Data acquision/recording system	Picodas 1000	Picodas(Canada)	Sampling frequency: 10Hz for magnetometer 1Hz for spectrometric system Interface:SCSI(ANSI x 3.131-1986) Data transfer rate: 1.5MB/sec Tape format: Read/Write -QIC-24 Tape capacity: DC300XLP -45MB
Base Station Magnetmeter	GSM-19	GEM Systems()	Dynamic range:10,000-100,000nT Sensitivity:±0.001nT, Sampling Rate:3Hz Noize Level:0.1nT
Spectrometer	GR-820		EXPORANIUM multi-channel gamma-ray spectrometer with 256 channels analysers for upward and downward looking cristals, crystal: GPX-1024(16.7L downward, 4.2L upward)×2 pairs
GPS	4000 SE	Trimble(U.S.A)	
Rader Altimeter	KRA-10	King(U.S.A)	Range: 20-2500ft Accuracy: 1% Resolution: 4mV/foot
Barometric Altimeter	1241	Rosemount(U.S.A)	Range: Sea level to 10,000ft Accuracy: 5feet Resolution: 1mV/foot

data are checked for +-10 degrees of roll, +-5 degrees of pitch and +-5 degrees of yaw to obtain variations of less than a cumulative of 3.0 nT.

(2) Intersection control

The magnetic field data is adjusted by analyzing the results obtained from the survey lines and the tie-lines.

(a) IGRF Residual map and RTP

IGRF residual map is obtained by subtracting the International Geomagnetic Reference Field (IGRF)) from the Total magnetic field (TMI).

The Reduction To Pole (RTP) is operation is a data processing technique that converts the TMI data as if the inducing magnetic field had a 90° inclination. This process that simplify the data interpretation, transforms the dipolar magnetic anomalies to monopolar anomalies placed over the magnetic sources. The Reduction to the pole process makes the simplifying assumption that the rocks in the survey area are all magnetised parallel to the earth's magnetic field

3-4-2 Radiometric survey

The system monitores cosmic ray activity for all energies above 3000 keV and display the full spectrum to facilitate energy calibration checks and assist in verifying system resolution.

The folowing windows were recorded for each 1-second sampling interval digitally recorded and displayed on the in-light chart recorder.

Potassium	1370 to 1570 keV
Uranium	1660 to 1860 keV
Thorium	2410 to 2810 keV
Total Count	400 to 2810 keV
Cosmic	3000 to 6000 keV
Upward-looking Uranium	1660 to 1860 keV

3-5 Results of Data Processing

The final products are as indicated below. To facilitate the interpretation, the score of factor 2 obtained from geochemical analysis were superposed to these maps.

Map of Flight Path : Fig. II-3-1

Total Magnetic Intensity Map: Fig. II-3-2

TMI Reduced To the Pole Map: Fig. II-3-3

Second Vertical Derivative Map: Fig. II-3-4