004898 314

WHITEHORSE CSA

Plane coordinates to UTM is as follows: Territorial Plane Northing/3.281824541 = UTM Northing Coordinates.
Territorial Plane Easting/3.281824541 + 500,000 = UTM Easting.

On the Coordinate listing sheet, those monuments with an "*" are remote Geodetic stations that have been incorporated into the WCSA network. Refer to the Geodetic Surveys of Canada data sheets for the description of these monuments. The stations that are shaded have either been destroyed and no longer exist or are stations that have been disturbed and whose coordinates are not reliable.

Most monuments consist of a CLS rock post or a Topographic tablet set in concrete or a CLS Standard post or a Topographic tablet set in a concrete cylinder. The monuments have an identifying number stamped on them such as 63G35. In most cases, the prefix of the identifying number indicates the year in which the monument was established (63G), followed by the station number (35). If an original monument was lost, a replacement monument may have an (A) or (B) added after the station number. Most of the coordinated monuments have reference points that can be checked to verify the stability of the monument. The reference points consist of 2cm diameter X 60cm long pieces of steel rebar (countersunk in the ground), a 2cm diameter X 5cm long steel plugs (cemented into sidewalks and curbs), building corners, and occasionally other secure points (described in "Comments"). On the description sheets, these points are indicated as: rebar = rb
steel plug = spl
building corner = bc
other points = other

On the coordinate sheet, the far right hand column "YEAR" indicates when the horizontal (H) and vertical (V) components of the monuments were surveyed. For those stations that have no attached date, the records at our LSD office of Energy, Mines and Resources, Yukon, are not sufficient to indicate the survey year.

NOTES REGARDING SPECIFIC MONUMENTS: "GREY" - The original "GREY MT, 1943" was destroyed and reestablished, based on evidence found of the original position, with "GREY" in 1977. No measurements have been made to confirm the monument's position.

"70G153" - This monument was disturbed during the installation of a nearby power pole. It is unclear but it appears that new measurements in 1986 resulted in the values listed for monument "83G153". Monument "90G153A" will replace "70G153" and coordinates should be available in 1992.

"63G78" - The coordinate listings also show a monument "63G78A". This may indicate that the monument has been disturbed and resurveyed at some point in the past. However, no record of a

. . . . . WHITEHORSE COORDINATED SURVEY AREA

The Whitehorse Coordinated Survey Area (WCSA) was established under section 42 of the Canada Lands Surveys Act and officially proclaimed on July 12, 1967, according to plan 53234 CLSR. Since this date the WCSA has been extended, destroyed monuments replaced and new monuments placed in an effort to upgrade the condition of the control net. Over the past two years, a major effort has resulted in a coordinated survey area which now consists of approximately 200 stations in good condition. In the future, new monuments will be established to fill in deficiencies in the network and to extend the network into the expanding subdivisions.

The WCSA manual contains the following information:

1) a listing of Coordinates (UTM and geographic) and elevations.
2) a listing of the Geodetic Bench Marks that exist within the coordinated survey area.
3) a Calibration Baseline data sheet - note that two new stations have been constructed in convenient locations. Geodetic Surveys of Canada observed the new distances and re-observed the old distances in August, 1991. The Calibration Baseline data sheet will be updated and circulated when the results of this work are available.
4) a WCSA monument update sheet - for reporting any errors, omissions, or distrurbances regarding the monuments.
5) description sheets for the following types of monuments;
   (a) VLBI stations
   (b) GPS Basenet stations (Pier) - coordinates are not yet available
   (c) Calibration Baseline stations
   (d) Coordinated control monuments (CCM)

The coordinates, of the WCSA monuments, are based on the Universal Transverse Mercator System, 6° UTM Zones. The WCSA is located in Zone 8 with central meridian 135° West Longitude. The coordinates are in metres and are based on the 1927 North American Datum (NAD27). The coordinates are reduced to sea level by a height scale factor and converted to the projection plane by a grid scale factor. The mean combined conversion scale factor is **.99949.** Elevations are in metres and referred to the Geodetic Datum. The procedures used to integrate a survey into the WCSA are outlined in Appendix 3 of the Manual of Instructions for the Survey of Canada Lands.

In the near future, new coordinates will be generated based on a new datum, NAD83. This shift is due to a Canada wide adjustment by Geodetic Survey of Canada and more information will be available at a later date. Until 1971, the coordinates published for the WCSA were based on the Territorial Plane Coordinate System. The Territorial system coordinates were in feet with negative values for points west of the central meridian. Conversion of Territorial

NEW IMPERIAL MINES LTD.

THE N.I.M. COORDINATE SYSTEM

A New Reference Coordinate System

For the Whitehorse Copper Belt

-Preliminary Report-

by

G.G. Carlson

Exploration Geologist

Definitions of Terms Used

Angular measure: A point relative to another point, on the circumference of a circle may be defined by a single angle plus the circle radius. Extended to a sphere, two angles plus the radius are required to define the point relative to two perpendicular planes which bisect the sphere.

Geodetic (geodesic) Coordinates: These coordinates use angular measure to define a point on the surface of the earth. The two planes of reference are the equatorial plane (0° latitude) and the plane passing through both poles and Greenwich, England (0° longitude). The radius measure is generally ignored.

Plane Coordinates: These coordinates define any point on a horizontal planar surface relative to a predetermined perpendicular grid system.

Introduction:

Over the many years of exploration and development work on the Whitehorse Copper Belt, a large number of rather small grid systems have been used as the need has arisen. The only system uniform over the entire area is the Territorial Plane Coordinate System, as related to the Whitehorse Reference Traverse. Unfortunately, these coordinates have never been taken beyond this line.

In order to correct this situation, and to tie all points in the copper belt region to a single referencing system, for both mapping and filing purposes, F.M. Smith has suggested incorporation of the National Topographic System (N.T.S.) of coordinates. This is a grid system, based on geodetic coordinates (longitude and latitude) which covers all of Canada. Since this system will not conveniently provide the accuracy required, a second north-south p l a n e grid system, derived from the Territorial Plane coordinate system, is also being used. The ultimate accuracy here will be to the nearest hundredth of a foot.

N.T.S. Geodetic Coordinates:

The Little Chief ore body is approximately located by the designation 105-D-11-i-II. This is a rectangular area approximately 5700 ft. by 5600 ft.

The basic division here is given by the first number, 105, which defines an area bounded by lines of longitude and latitude. Its dimensions are, in an east-west direction, 8^{o} of longitude, and, in a north-south direction, 4^{o} of latitude. In the Whitehorse area, these dimensions are approximately 271.0 miles and 275.5 miles respectively. (See Map 1)

This area is in turn divided into 16 smaller areas of equal angular dimensions, designated by capital letters from A to P. The N.T.S. 1:250,000 Whitehorse sheet, 105-D (see Map 2), extending from 60°-00'-00" N. to 61°-00'-00" N. latitude and from 134°-00'-00" W. to 136°-00'-00" W. longitude, covers the entire copper belt.

All subsequent divisions are similar to the previous one. That is, each area is divided into 16 smaller areas of equal angular dimensions. With the third division, N.T.S. sheets 105-D-10, 11 and 14 are required to cover the New Imperial property (see Map 3). These are at a scale of 1:50,000, or approximately 1.25 inces = 1 mile. The small letter designations, from a to p on each sheet will provide the basic divisions within the copper belt. An exploration area, such as the Best Chance 68 linecutting grid, may be readily located in the area 105-D-11-o. The final division, into Roman Numeral areas, would be used to pin point smaller areas, such as the original example of the Little Chief ore body. (See Map 4)

N.I.M. Plane Coordinates:

The Whitehorse Reference Traverse was surveyed using the Territorial Plane Coordinate System, with the origin on the equator at 135°-00'-00" W. longitude. This system gives locations to the nearest hundredth of a foot, but, in the Whitehorse area, the northings are extremely large numbers, and most of the eastings are negative. For this reason, a new origin, to the south and west of all points on the property, was chosen. The conversion from Territorial Plane coordinates to N.I.M. coordinates for the Whitehorse Reference Traverse is shown in Table 1.

Oct. /69

WHITEHORSE REFERENCE TRAVERSE

(Revised)

COORDINATE TABLE

STATION	NORTHING	EASTING
BL0	99,807.89	50,694.79
BL2	96,962.82	49,858.50
BL10	83,912.33	48,599.54
BL18	69,484.14	50,011.91
BL21	65,801.84	52,176.13
BL25	61,563.22	57,111.20
BL27	58,702.70	59,038.85
BL35	47,916.85	70,859.82
BL42	35,118.23	75,993.67
BL45	31,398.91	78,509.20
BL57	26,934.41	101,682.99

B.L.35 is at approximately 60°-37'-52.7" N. LAT.
135°-02'-58.8" W. LONG.

Transformation from Territorial Plane coordinates to revised N.I.M. coordinate system.

Northing = Lat. - 22,011,000.00

Easting = Dep. + 80,000.00

Table 1

Whitehorse Reference Traverse

Coordinate Table

Station	Territorial Plane Coordinates		N.I.M. Coordinates	
	Latitude	Departure	Northing	Easting
B.L.0	+22,110,807.89	-29,305.21	99,807.89	50,694.79
B.L.2	107,962.82	-30,141.50	96,962.82	49,858.50
B.L.10	094,912.33	-31,400.46	83,912.33	48,599.54
B.L.18	080,484.14	-29,988.09	69,484.14	50,011.91
B.L.21	076,801.84	-27,823.87	65,801.84	52,176.13
B.L.25	072,563.22	-22,888.80	61,563.22	57,111.20
B.L.27	069,702.70	-20,961.15	58,702.70	59,038.85
B.L.35	058,916.85	- 9,140.18	47,916.85	70,859.82
B.L.42	046,118.23	- 4,006.33	35,118.23	75,993.67
B.L.45	042,398.91	- 1,490.80	31,398.91	78,509.20
B.L.57	037,934.41	+21,682.99	26,934.41	101,682.99

Conversion Factors: Northing = Latitude -22,011,000.00

Easting = Departure +80,000.00

UTM

6724196 508912

Find UTM from lat longs

Conversion From Geodetic to Plane Coordinates:

As the geodetic areas become smaller, their shape approaches that of a rectangle. In an area as small as the copper belt, all lines of longitude may be considered parallel, and thus all geodetic areas of a specific angular size may be called equidimensional. The problem, then, is to correlate two parallel grid systems.

a) Longitude: A value of 2980 ft. for one degree of longitude was obtained by scaling off the N.T.S. 1:50,000 sheet along the line of 60°-45'-00" N. latitude.

b) Latitude: The distance between lines of latitude is relatively constant, with only a small variation from the equator to the poles. The average of these values, 6060 ft. for one minute of latitude, provides a sufficiently accurate figure for use here.

c) Ground Control: Station B.L.-35, on the Whitehorse Reference Traverse, was located as accurately as possible on N.T.S. sheet 105-D-11, using triangulation with natural landmarks from the Lockwood Survey topographic sheets. The resulting geodetic coordinates are:

60°-37'-52.7"N.; 135°-02'-58.8"W.

The N.I.M. coordinates are:

47,916'.85 N.; 70,859'.82 E.

From these values, the conversion from geodetic to plane coordinates can be accomplished for any point in the copper belt area. The accuracy for the conversion is probably not better than 20 to 50 ft., but this is sufficient for all purposes intended.

Use of the N.I.M. Coordinate System:

a) Geodetic Coordinates:

The small letter squares, approximately 22,500 foot squares, will provide the basis for an overall filing system of maps at 1 inch = 1000 feet and data for the entire copper belt. There will be six of these map sheets with Herculean overlays of topography, geology, ground magnetics, aeromagnetics, claims and exploration grid plans on the photos of the area. The Roman Numeral rectangles will be used on top of this for more precise location and filing. The file system will be based on these six areas, with the smaller divisions used as necessary. All information on the property will be stored in this manner. These six areas are 105-D-10-f (Cowley Park 69), 10-e (Cowley Park 68 to Gem 69), 11-h (Gem 69 to Pass Lake), 11-i (Valerie to the Best Chance ore body), 11-o (Best Chance 68) and 14-b (War Eagle). The first two reference figures, 105 and D, may be left off here since they are common to the whole property.

b) P l a n e Coordinates:

These coordinates would not relate to the filing or classifications of specific areas, but all survey monuments, diamond drill holes and other surface plans would be tied in to them. At present, all surface surveying for the underground work is being tied to this grid system.

Conclusions:

Work is underway to reduce all pertinent maps on the property to a scale of 1 inch = 400 feet. All information at this scale will then be joined together in the six basic sheets and sent for final reduction to 1 inch = 1000 feet.

Simultaneously, the present filing system is being revised, and the coordinates of all surveying monuments are being revised.

Although the original work on this project has produced a few difficult problems, and much work has yet to be done, work is progressing smoothly, and the project should be completed before summer 1970.