

M E M O R A N D U M

TO: M.O. Hampton
FROM: F.P. Forrest
DATE: July 16, 1971
SUBJECT: PRELIMINARY REPORT - COMPARISON OF PREDICTED
AND ACTUAL PIT ORE GRADE AND TONNAGE

Conclusion

To enable a bench ore assay and tonnage comparison, the data will be organized in an index for easy reference, data compiled to date, and a system for easy up-dating will be established.

The indexing will require additional man hours but a net man hour saving will be experienced once the system has been established. Future up-dating of new data will be independent of time and special studies will have an easy access to information.

Purpose

To compare D.D.H. assays to blast hole assays and D.D.H. tonnages to mined tonnages, and draw conclusions from the results. Also, a system is to be established to enable the continued up-dating of the comparison with future data.

Discussion

The project requires a compilation of data and a system for its continuation.

An analysis of the present system revealed the following functions of each section involved.

c) 100 scale - showing pit actual data on individual bench plans on sepi.

1. Survey Department

- a. Surveys ore blast holes.
- b. Plots holes on bi-monthly pit plans recording ore blast hole number (four digits shown for one hole per blast)
- c. Plots holes on monthly bench sheets (1" = 50' scale)

- using sample number as hole number

2. Planning Engineer

- a. Traces holes onto bench planning one sheet and plots combined assays for each hole.
- b. Utilizes data shown to
 - i) Plan ore grades
 - ii) Plan last pass
 - iii) Check blasting-powder usage
 - iv) Check plan predictions for ore and waste

use one out. del. copy.

① - bench planning sheet showing

planned adjustment pit out lines - ore blocks

on individual bench sheets (pup) with hole number (+ digits) and blast date.

3. Ore Control Geologist

- a. Traces holes and numbers to the bench ore control sheet.
- b. Tabulates assay data on inactive area of the plan.
- c. Utilizes data shown to
 - i) Predict day to day ore control
 - ii) Calculate tonnages
 - iii) Calculate grade of blast
 - iv) Plan future benches

holes + assay values

Keeps tabulation of blast averages shown. Sepia to have ore blocks

② Uses the 1" = 50' monthly bench sheets to compare D.D.H. block assays with blast hole assays.

Eliminate

4. Assay Lab.

- a. Issues assay sheet to Ore Control Geologist showing blast hole number and respective assays.

The foregoing procedure entails duplication and develops masses of information that cannot be readily related to the original data. The change implemented on Tuesday of the Survey Department, plotting ore blast holes directly onto individual ^{bench} blast hole plans (1" = 100' scale) will provide an index for all future ore blast hole information. All holes for each blast should be enclosed (i.e. dashed lines) with the blast number and date recorded. This will make monthly blasting information readily discernible (Different coloured sections may prove useful). Elimination of plotting the blast holes on 1" = 50' scale will reduce the work load and allow time for other tasks. Re-plotting all information onto the bench plans will provide a complete index for ore hole blasting.

Need 2 sets of ore blocks for Eng + Geol
2 sets of ore blocks - pit plans
2 sets of pit plans

While the preparation of the new bench ore blast hole plans and the recording of all data will be time consuming, the elimination of the 1" = 50' scale monthly blast hole bench plans will create a net man hour saving. The index established will allow ore block analysis and up-dating to be made at any point of time (i.e. Summer project). A reduction in the quantity of plans will result.

Ore blast hole comparison bench sheets will be completed showing predicted data from D.D.H.'s and the record of ore blast holes within D.D.H. blocks. Some details will be lost by changing from 1" = 50' scale to 1" = 100' scale, but the information will be immediately discernible as to within which particular D.D.H. block it lies. Compilation of data on one plan per bench will reduce the possibility of information being lost or destroyed.

Your comments would be appreciated.

Pete

F.P. Forrest
Assistant Planning Engineer

MEMORANDUM

TO: M. O. Hampton
J. W. Mossop (see 11 B)
J. McLachlan
P. Pettigrew
N. Stephenson

FROM: J. Gondi

DATE: September 30, 1970

SUBJECT: PROCEDURES FOR ORE CONTROL AND TONNAGE, GRADE PREDICTIONS

Please find enclosed tentative procedures for ore control and tonnage, Grade predictions. ^IWe would invite your comments and suggestions. A manual is being prepared and shall be ready by the second week of October consolidating all the results of experimental period.

J. Gondi

J. Gondi
Senior Geologist

JG/mm

Enc.

APPROVED BY ONE AND
~~ALL~~

Sept 29, 1970

111. MINE DEPARTMENT'S RESPONSIBILITIES:

- (a) Discuss with the Geologist at the beginning of each shift to determine shovel/front end loader locations and of their variations, truck load ratios of high and low grade ore.
- (b) If any variations to the above were made, indicate on the 1" to 50' scale map supplied, however, keeping the supply of ore at a consistent 12% grade of combined lead and zinc.
- (c) Plot the area mined out at the end of each shift in absence of Geologist on the 1" to 50' scale map supplied.
- (d) The high grade stock pile located near the Crusher should keep consistent with 12% combined lead and zinc and under no circumstances should it be allowed for dilution.
- (e) The minimum limit on low grade stock pile is 5% combined lead and zinc.

IV. MINE PLANNING ENGINEERS RESPONSIBILITIES:

- (a) Supply the Mining Schedule of each bench monthly/yearly to ore control Engineer.
- (b) Inform the Geologist of the tonnage of ore mined from each bench in each shift/day.
- (c) Supply the tonnage of ore shipped to low grade stock pile/high grade stock pile in each shift/day to Geologist.
- (d) Co-ordinate with Geologist in ore Mining Schedule in order to supply consistent 12% combined lead and zinc ore to the mill.

TENTATIVE PROCEDURES FOR ORE GRADE

CONTROL AND TONNAGE ESTIMATES

1. SURVEYORS RESPONSIBILITIES:

- (a) To locate, sample and record the ore blast holes and waste holes on Survey Sheets on scales of 1" to 50' and 1" to 100'.
- (b) Establish ore control points on ore benches under the direction of the Geologist.
- (c) Survey and plot the crests of ore benches at least once a week.

11. GEOLOGY DEPARTMENT'S RESPONSIBILITIES:

- (a) Estimate the tonnages and grades of Sulphides of each blast.
- (b) Predetermine the ore blending for a consistent supply of 12% combined lead and zinc to the mill. (max. 7% Zn)
- (c) Discuss with Mine Superintendent/Foreman at the beginning of each shift to determine shovel/front end loader locations and of their variations, truck load ratios of high and low grade ore.
- (d) Plot the area mined out at the end of shift and determine the tonnages and grades of ore broken and left in place.
- (e) Predict the percentages of Gangue inherent with ore, internal and external waste. Break down into mineral assemblages and rock assemblages.
- (f) Forward copies of grade prediction sheets to Mill Superintendent, Mine Superintendent, and Chief Engineer.
- (g) Compare with actual grades milled and establish a variation factor, if possible, and if a good coincidence occurs between the actual ore shipped and milled.

MEMORANDUM

TO: M.O. Hampton
FROM: F.P. Forrest
DATE: August 19, 1971
SUBJECT: PIT PROGRESS AND ORE BLAST HOLE DATA COLLECTION
AND RECORDING SYSTEM

Attached is a revised pit progress and ore blast hole collection
and recording system for your approval.



F.P. Forrest

Assistant Planning Engineer

FPE/abc

PIT PROGRESS AND ORE BLAST HOLE DATA COLLECTION & RECORDING SYSTEM

The following is a summary of the revised system for obtaining and recording pit progress and ore blast hole data. The function of each department involved is discussed separately.

1. Surveyors

a) Blast Holes

Surveying

Survey all ore blast holes. Record ore hole numbers (sample numbers) in survey field notes. Survey all sampled holes. Survey waste holes within an ore blast. Survey waste holes along an ore/waste contact.

Recording - Bench Ore Drill Hole Index

Plot surveyed data on individual bench plans (bench plans shows ultimate pit outline and diamond drill holes). Plot sample holes as circles with numbers recorded. Plot waste holes as squares. Record a four digit sample hole number and the blast date within the dashed line perimeter of the blasted area.

DELETE

NOT USED - EASIER
TO PLOT SURVEY
POINTS ON EACH
SEPIA AS THERE
ARE A LIMITED
NUMBER OF DIE BENCHES WORKING AT ONE TIME.

Plotting Method

Overlay bench plan on semi-monthly pit work sheets and with use of compass, plot directly onto the bench plan. Use of the semi-monthly plan eliminates duplication of plotting survey points. Overlaying on the semi-monthly pit plan will provide the surveyors with a quick check that the holes are plotted correctly.

b) Routine Daily Pit Surveys

- 1) Plot data on semi-monthly progress pit plans.
- 2) Trace monthly progress onto the monthly progress bench plan (new). Bench plan sepia print shows diamond drill holes, ultimate pit limit, and mining phase outlines. Planimeter progress and calculate volume removed from bench monthly.

2. Planning Engineer

Utilize Actual and Predicted Bench Plans prepared by the Ore Control Geologist.

3. Ore Control Geologist

a) Actual Bench Plan

Trace ore holes and plot assay values with respective holes. Denote sampled waste holes - (W)

Trace ore/waste contact waste holes and waste inclusion holes.

Trace monthly crests from status sheets.

Calculate ore mucked per month. (Shades area on plan.)

Bench plan sepia print shows:

- 1) ore blocks within one half bench outline
- 2) ultimate pit limit
- 3) mining phase outlines
- 4) diamond drill holes

b) Prediction Bench Plan

Trace monthly crests from status sheets.

Shade area of predicted ore mucked per month. Cross-hatch area of ore mucked outside predicted ore zone.

Calculate predicted ore tonnage.

Bench plan sepia print shows:

- 1) ore blocks within one half bench outline
- 2) ultimate pit limit
- 3) full bench
- 4) diamond drill holes

Compare actual monthly oremucked to predicted monthly ore mucked.

c) File ore blast hole assay information. File sample books.

d) Up-date comparison of predicted and actual pit ore grade and tonnage. (SEE STUDY FOR DETAILS)

4. Assayer

Issue assay sheet to Ore Control Geologist showing blast hole sample number and respective assay.

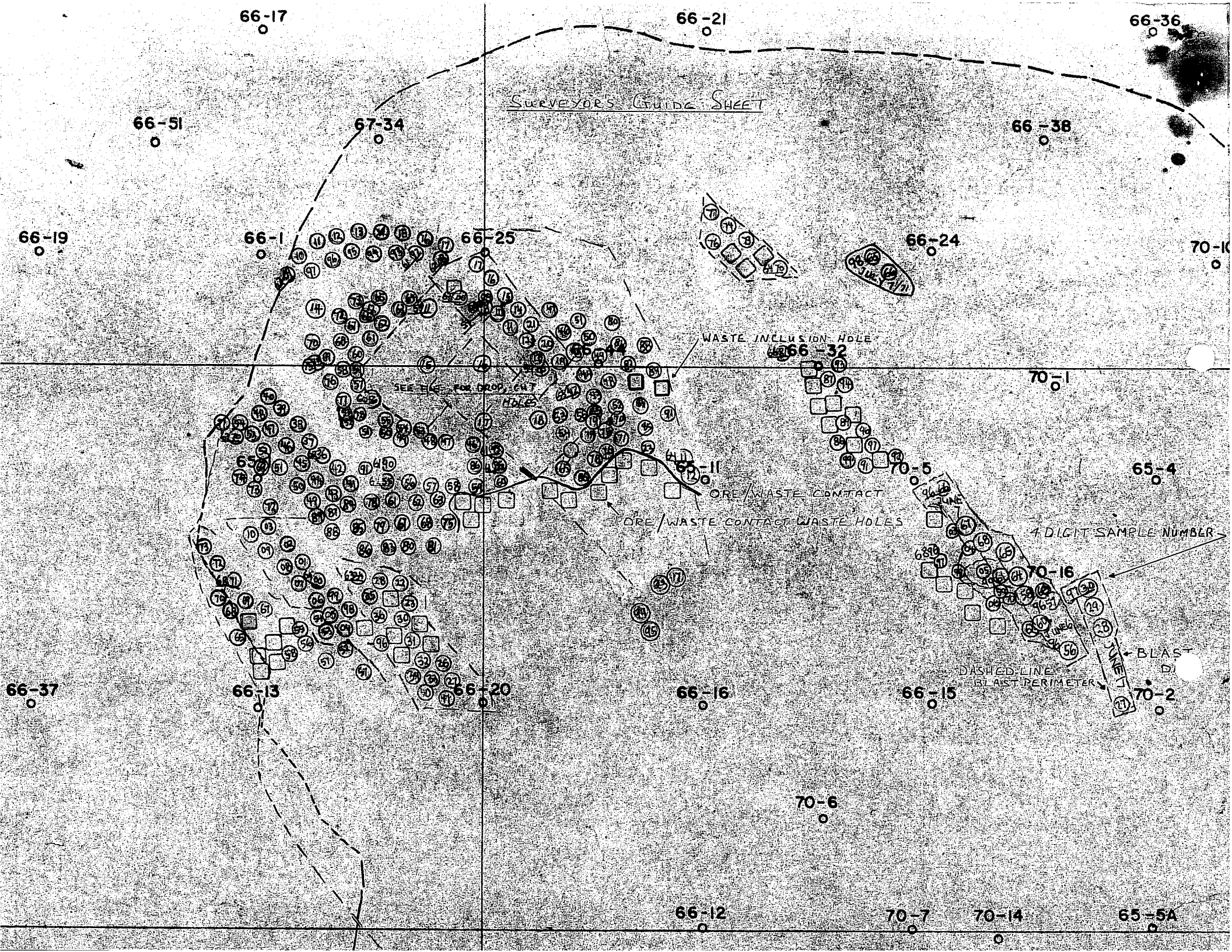
5. Production Department Clerk

Maintain a daily muck sheet showing daily and cumulative mucked ore or waste per bench.

Attachment - Surveyor's Guide Sheet

FPF/abc

SURVEYORS GUIDE SHEET



SEE HERE FOR DROP CUT HOLES

WASTE INCLUSION HOLE

ORE/WASTE CONTACT

ORE/WASTE CONTACT WASTE HOLES

4-DIGIT SAMPLE NUMBER

DASHED LINE FOR BLAST PERIMETER

BLAST DI