**PC Underground Forecaster**

**Proposed Upgrades**

**Database Changes**

* Update to Office 2010
* CASE

CAL\_NO Default calendar to be used.

NUM\_WEEKS

PERIOD add shift?

QUALITY\_DB

RESULTS Name of a results table with quality (calculated from QUALITY\_DB) to be

added to db.

TIMESTAMP Date when forecast last run for this case.

Notes: a ‘RESULTS’ table in the current db is always generated with no quality (timing only).

If NUM\_WEEKS & PERIOD are left blank: calculate quality from current timing using

QUALITY\_DB and write into table specified in RESULTS.

If QUALITY\_DB & RESULTS are left blank: do timing only (overwrite ‘RESULTS’ table).

* CALENDAR

CAL\_NO

MON\_DATE

MON thru SUN Three character field one character for each shift (midnight, day, afternoon). An ‘X’ indicates a shift will be worked. e.g. ‘X(space)X’ means midnight and afternoon shift will be worked. An ‘H’ as the first character indicates a holiday that day.

COMMENTS

Notes: this will ensure that any timing will never be more than a shift late. There will also be a program for easily generating calendars.

* GEOMETRY

SECT

TYPE Must exist in SECTION\_TYPE.

INIT\_STN

X\_COORD

Y\_COORD

AZIMUTH

LENGTH

WIDTH

ENTRIES+

RECOVERY

LINEAR\_FACTOR

* SECTION\_TYPE

TYPE Confined to the following:

for LWs LWA,B,C or D plus \*

for mains CMM plus \*

for development CMD plus \*

for advance CMA plus \*

for retreat CMR plus \*

where \* is any number of alphanumeric characters (user defined).

* GEOMETRY\_EXCEPTIONS

SECT must exist in GEOMETRY.

START\_STN

END\_STN

WIDTH

ENTRIES+

RECOVERY

LINEAR\_FACTOR

* RATES

UNIT Must exist in EQUIPMENT (allow wildcards).

TYPE Must exist in SECTION\_TYPE (allow wildcards).

FT\_P\_MS

TNS\_PMS

TNS\_FT

AVAILABILITY % of scheduled shift actually spent mining.

COAL

MAX\_TPMS

MAX\_FTPMS

Notes:

UNIT/TYPE combination must be unique.

The UNIT specified here actually refers to a crew/shift combination. Initially a crew will be assigned to the corresponding piece of equipment (e.g. CM1 crew to equipment CM1) but can be reassigned (moved) using exceptions which by default are referring to crews. The system will track which crews are working with what equipment.

* EQUIPMENT

UNIT Must begin with ‘LWx’ or ‘CMx’, where x is any number.

START\_DATE Unit cannot be used before this date (can be blank for start of forecast).

END\_DATE Unit cannot be used after this date (can be blank for end of forecast).

Notes:

The START\_DATE and END\_DATE define how many units can be active at the same time.

The UNIT specified here is regarded as a physical piece of equipment (CM or LW).

* SEQUENCE

ORDER User defined mining sequence

SECT

START

END

BEGIN Starting date (optional shift: see below)

UNIT1 Starting unit when it is available.

MOVE1 (old D1)

UNIT2 Specify super section

MOVE2

SETUP\_UNIT Unit to do setup

SETUP\_MOVE Delay to move unit to setup

SETUP\_REF (old REF2)

SETUP\_STN (old STN2)

SETUP\_DELAY (old D2)

CONCURRENT true/false

Notes:

The UNITs referred to here are EQUIPMENT and must be ‘available’ before mining can start.

A unit becomes ‘available’ when it has finished mining a section or finished doing a setup.

Blank UNITs means move unit from SETUP to SECT when setup completed, in which case the unit does not become available.

A unit cannot be mining in multiple sections at the same time.

There cannot be more units running at the same time than indicated by the EQUIPMENT table. (Units can be defined as ‘in-use’ using the START and END dates).

D1, D2 allow ability to specify shifts based on the actual calendar (C) as well as shifts based on the specified operating calendar (O). The format would be:

cccXO(default)/C and combinations thereof.

The ccc could be any number of user-defined characters (optional), and X is the number of shifts.

e.g L10C, S9O, MOV6 , 10

D2 decreases on REF reaching STN and the setup unit has moved.

A CONCURRENT of false means D1 decreases when UNIT becomes available and D2 is zero (currently how it works).

A CONCURRENT of true means D1 can decrease when D2 starts decreasing and UNIT is available.

Regardless a code for a ‘teardown’ (to be agreed upon) in D1 can start as soon as UNIT becomes available.

A D2 of 0 means that the setup should be included in D1 using the appropriate codes (again to be agreed on).

All stations can specify BEGIN/END +/- as required, or not.

BEGIN can include a shift designation if required. (M, D or A in parentheses after the date, M would be the default, e.g. 7/3/2012 (D).)

Supersections:

A supersection is defined when UNIT2 is specified.

The different units move into the section whenever they become available and setup has been completed.

The rate in the supersection is the addition of the individual unit rates. See the EXCEPTIONS

table for how to specify a different rate.

* EXCEPTIONS

Components:

AFFECTED\_UNIT1 Crew/Shift combination (see notes).

AFFECTED\_UNIT2 Crew/Shift combination (see notes), used to specify super section rates. Requires a UNIT1 be specified.

AFFECTED\_SECT Must exist in GEOMETRY.

AFFECTED\_TYPE Must exist in SECTION\_TYPE.

Notes:

Allow wildcards in all above fields.

Possible combinations for rate changes:

UNITs SECT TYPE

1 X change rate wherever unit is.

2 X X change rate if unit is in specified section.

3 X X change RATES table.

4 X change rate whatever unit in section.

5 X change rate whatever unit in type.

2 applies only while unit is in the section but still subject to triggers.

3 is an actual change to RATES table, but could be temporary or permanent according to

triggers.

4,5 applies to whatever unit in section or any unit that comes into section and would supersede any unit rate for that section.

REF\_UNIT Crew/Shift combination (see notes).

REF\_SECT Must exist in GEOMETRY.

REF\_TYPE Must exist in SECTION\_TYPE.

Notes:

Allow wildcards in all above fields.

Possible combinations for rate changes:

UNIT SECT TYPE

1 X X

2 X X

3 X

4 X

5

5 default to AFFECTED units/sections if START\_STN and/or END\_STN specified.

Triggers:

START\_STN Default to start of REF\_SECT/TYPE

END\_STN Default to end of REF\_SECT/TYPE

Note: can specify BEGIN/END +/- as required, or not.

START\_DATE

END\_DATE

Note: can include a shift designation if required. (See BEGIN in SEQUENCE).

DURATION no. of scheduled shifts

Position Trigger Combinations:

START\_STN END\_STN DURATION

X Reference Exception (permanent)

X X Area Exception (temporary)

X X Period Exception (temporary)

Date Trigger Combinations:

START\_DATE END\_DATE DURATION

X Date Exception (permanent)

X X Period Exception (temporary)

X X Period Exception (temporary)

Notes:

Position triggers can be ANDed with date triggers.

Duration can include delay information (see D1,D2 in SEQUENCE table) for a shutdown (see below).

Change any or all of the following:

FT\_P\_MS

TNS\_P\_MS

INCRS A percentage if non-blank (can be –ve, +ve, 0 or above 100). Used as a multiplier to current rate.

TNS\_P\_FT

AVAILABILITY A percentage. (See RATES.)

Notes:

FT\_P\_MS is used if both FT\_P\_MS and TNS\_P\_MS are given.

They can all be blank (see below) but a zero for any field implies a shutdown for the affected units/sections.

Any entry will cause a restart after a shutdown. To restart at current rate set INCRS to 100

with no FT\_P\_MS or TNS\_P\_MS.

CAL\_NO Must be in CALENDAR table. Can accompany a rate change or not.

Crew Move

Occurs when no rate or calendar change.

The reference UNIT replaces the affected UNIT and the reference unit rate is now used in the affected section.

Must be a unique unit in each case: no wildcards, no type.

N.B.

The units here apply to a crew/shift combination by default not equipment.

Once a move is made the system will track which crew is used with which equipment.

To apply an exception to a piece of equipment, specify the unit with a prefix of (E), e.g. CM1 (E).

An (E) could appear alone which would signify a change to whatever equipment is in the section, not the crew.

An equipment rate would supersede a crew/shift rate or a section rate.

* SHUTDOWNS

UNIT

SECT

TYPE

LW LW UNIT in EQUIPMENT table.

START\_DATE If blank default to start of forecast.

END\_DATE If blank default to end of forecast.

Note:

UNIT/SECT/TYPE follow the same rules as the AFFECTED components in EXCEPTIONS and could refer to crew/shift or equipment.

These exceptions occur during LW (equipment) moves and cause the affected units/sections to be shutdown during the move.

* SAMPLES and ADJUSTMENTS Tables

Can be missing or be overridden by TONS\_PER\_FT in RATES table.

Add a third type: CMR for CM retreat sections.

* RESULTS Table

BEGIN

SECT

TYPE

UNIT

SUPER

START

END

AREA

LATE

LEAD

MAX\_USED

PERIOD

RECOV

LINEAR\_FEET

SCHEDULE List of shifts scheduled each day this period: 0 thru 32 entries, comma delimited.

SHIFTS Sum of shifts worked in period: from SCHEDULE .

DAYS Sum of days scheduled in period: from SCHEDULE (where shifts > 0).

AVAILABILITIES List of availabilities for each shift scheduled.

AVAILABILITY Sum of availabilities.

Add DELAYS List of shifts delayed each day this period: 0 thru 32 entries, comma delimited.

Add TYPE\_DAYS List of delay types corresponding to shifts in DELAYS: 0 thru 32 characters,

comma delimited.

Note: possibly remove SEAM\_HT from quality fields and include DLN\_THICK from ADJUSTMENTS on reports.

Database Editing

* Auto complete section names
* Ability to filter/sort tables for display/editing
* Allow both lower and upper case
* Import calendars from Excel
* Set ‘dirty flag’ in sequence table
* Will need:

Updated ‘New’ database function

‘Import’ old database function

* Check RECOV value in GEOMETRY table (e.g. warn if <35% for CMs)
* Ability to copy/paste/insert multiple rows (perhaps color rows?)
* CASE editing with option to run
* Updated ‘Export’ function
* Change section names as a group

Report Writer

* Need only ‘Select Report’ option from current VCReport
* Add ‘Print Preview’ function
* Add Quality Data Reports
* Add this as an option to Database Editing/Microstation

WinFore

* Reduce to ‘Run’ option only with a single ‘Start’ button: still allow case editing
* Also invoke from Database Editing/Microstation (would go directly to start)
* There would be no Results (VCReport) or Geometry(VCMine) options

Microstation

* Show delays from Sequence Table
* Remove Access button from Forecaster Menu
* Additional mapping features: quality, clean tns/ft, feet/ms, etc.
* Specify Geometry and/or ref exceptions graphically
* Advance/Retreat dialog needs additional parameters to calculate retreat geometry
* More fields/totals in ‘Timing Loop Results’ dialog and display