Drillingsoftware
Mud Engineer User Manual

1. Introduction

   This program provides the engineer with all the mud engineering inputs and calculations required for both Water Based Mud (WBM) and Oil Based Mud (OBM). Figures and flow charts are used to aid the engineer to navigate through the program. As the data is entered in the various dialog boxes, the data bases, reports and the charts are updated

2. Operation

   A. Main Menu

   The Main Menu is the entry point to all functions of the program. For all Main Menu button functions refer to Figure 2.

Figure 1 Main Menu

Figure 2 shows all the mud engineering button functions and references to where the relevant information is to be found.

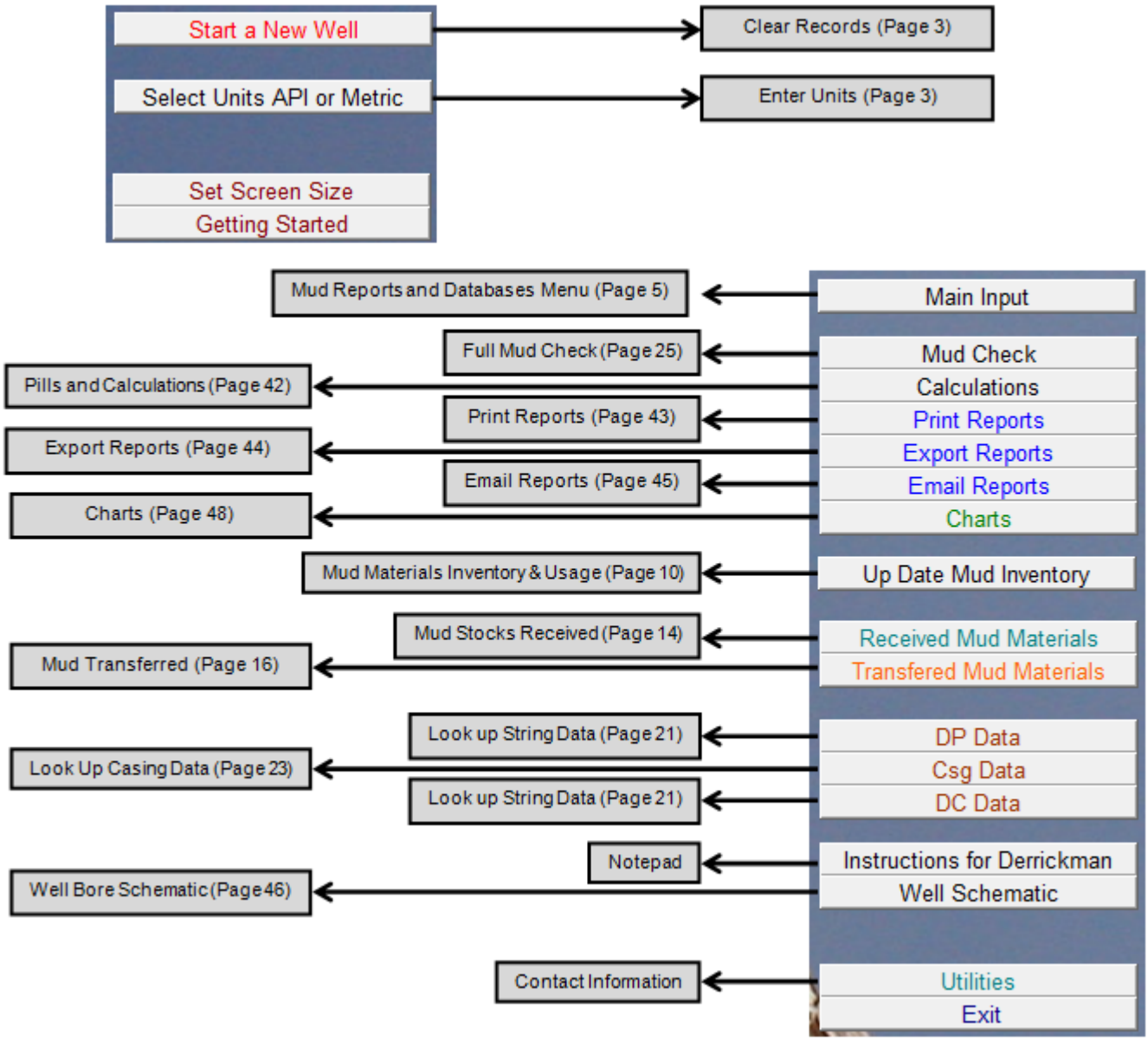


Figure 2 Main Menu Button Functions

B. Starting a New Well

Before starting a new well it is necessary to clear all the previously entered data and enter the units to be used throughout the program. These can be either API or Metric or a combination of both.

(1) Clear Records

On the Main Menu page, select Start a New Well (Ref. Figure 1). The Clear Records Page is shown (Ref. Figure 3).

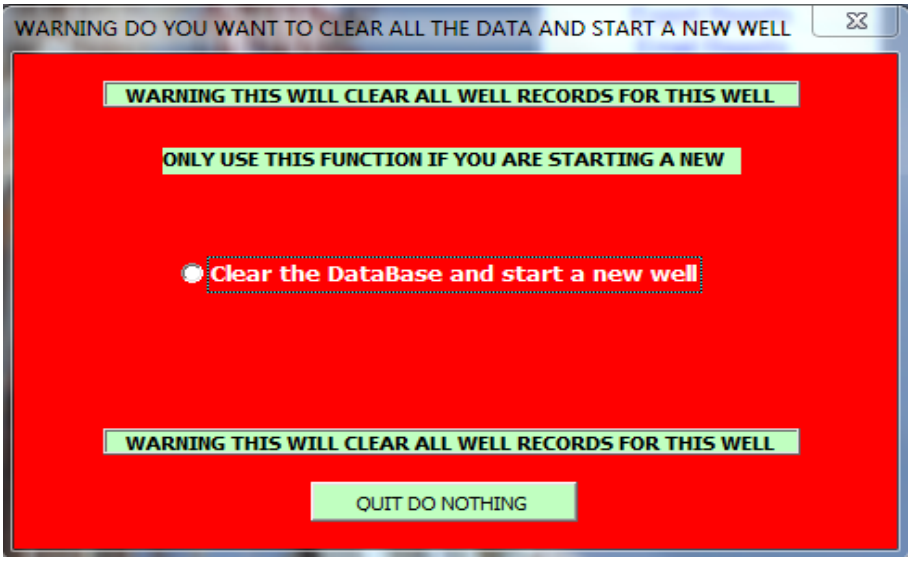


Figure 3 Clear Records

Select Clear the DataBase and start a new well. After approximately 10 seconds a message box is shown indicating that these databases have been deleted:

- Mud Received
- Mud Check Report
- Mud Materials Inventory.

Select OK. The program returns to the Main Menu (Ref. Figure 1).

(2) Enter Units

On the Main Menu page, select Select Units API or Metric. A warning is shown. This informs the operator that the selected units will be used throughout the entire program.

Select OK. The Select Units dialog box is shown (Ref. Figure 4).

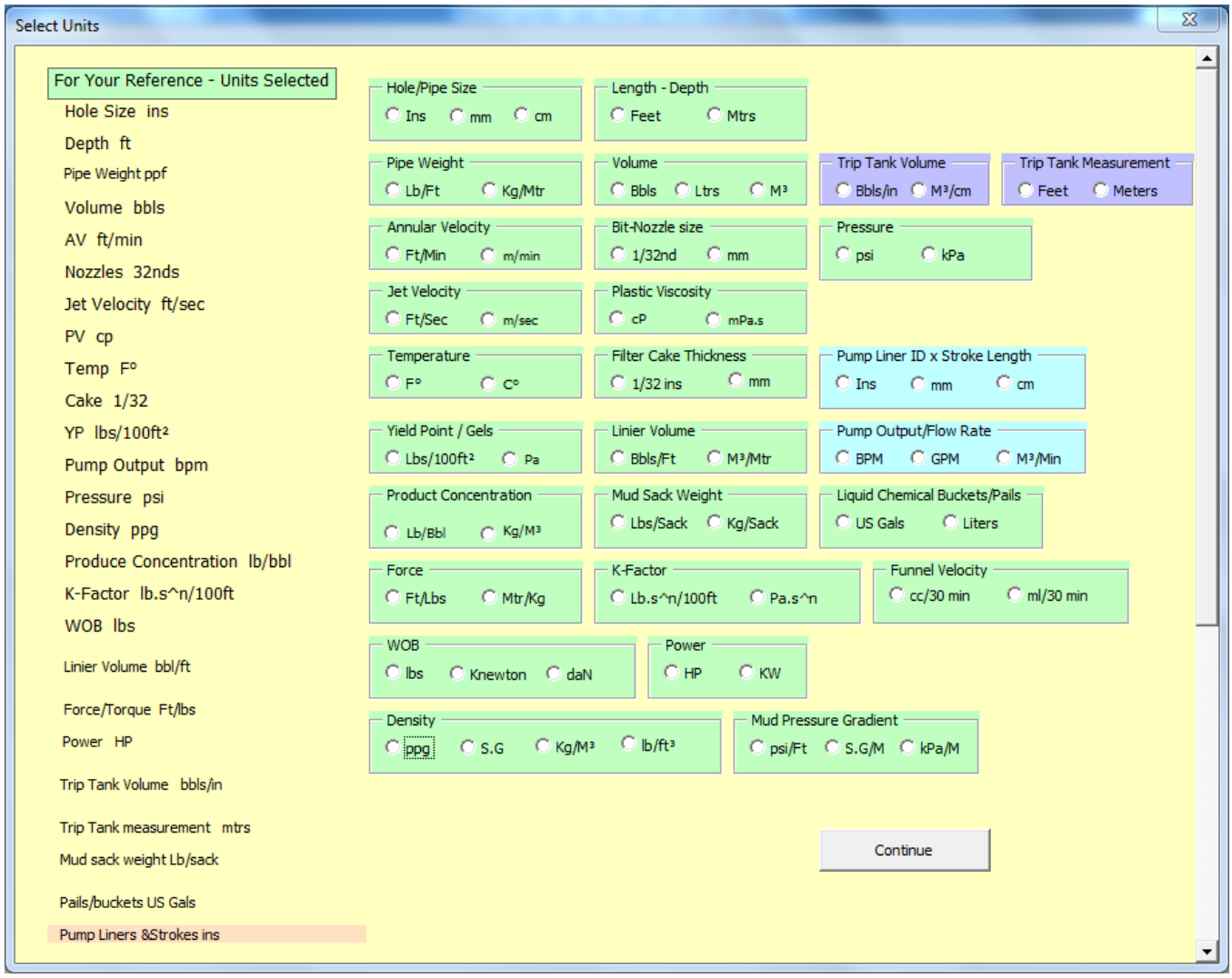
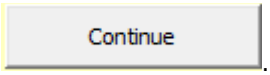


Figure 4 Select Units

On the left margin of the Select Units dialog box, all previously selected units are shown. This is for reference only. These units can be changed using the appropriate entry field.

When all the required data has been entered, select 

. The program returns to the Main Menu (Ref. Figure 1).

C. Mud Reports and Databases Menu

On the Main Menu page, select Main Input. The Mud Reports and Databases Menu is shown (Ref. Figure 5).

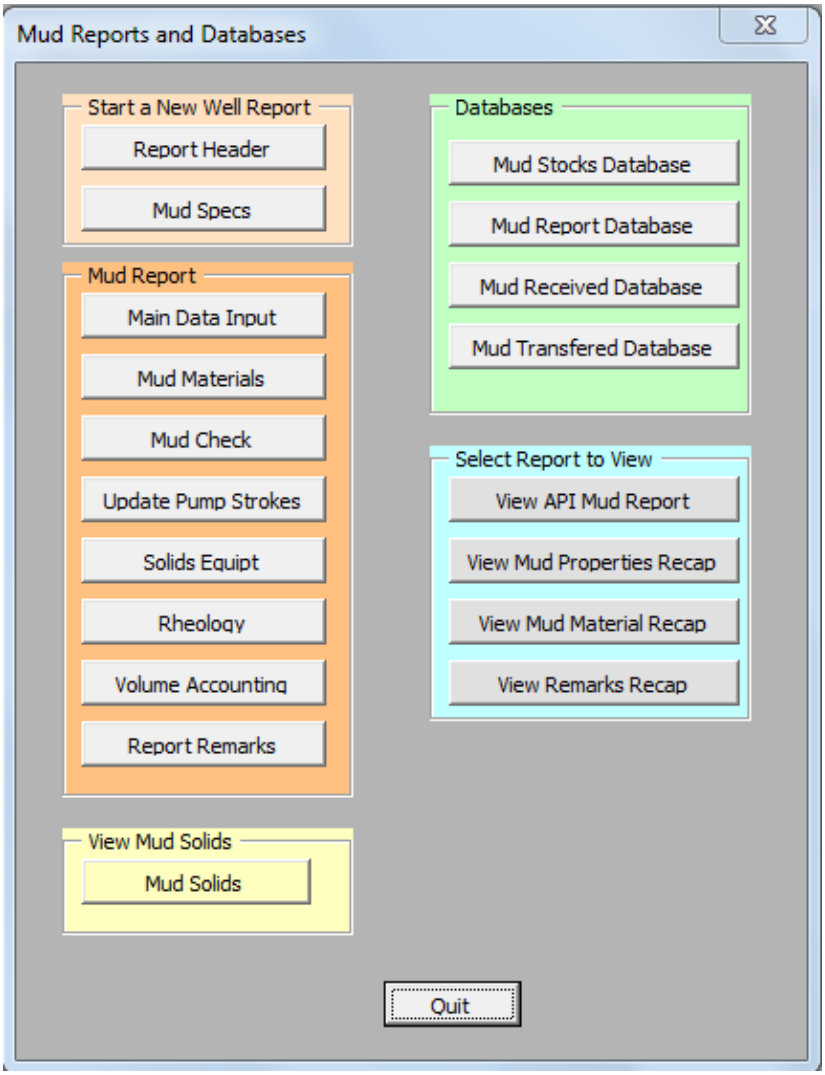


Figure 5 Mud Reports and Databases Menu

The Mud Reports and Databases Menu is the entry point for all the mud engineering parameters. Figure 6 shows each button function. References to figures, flow charts and page numbers are a guide to where that particular information is to be found.

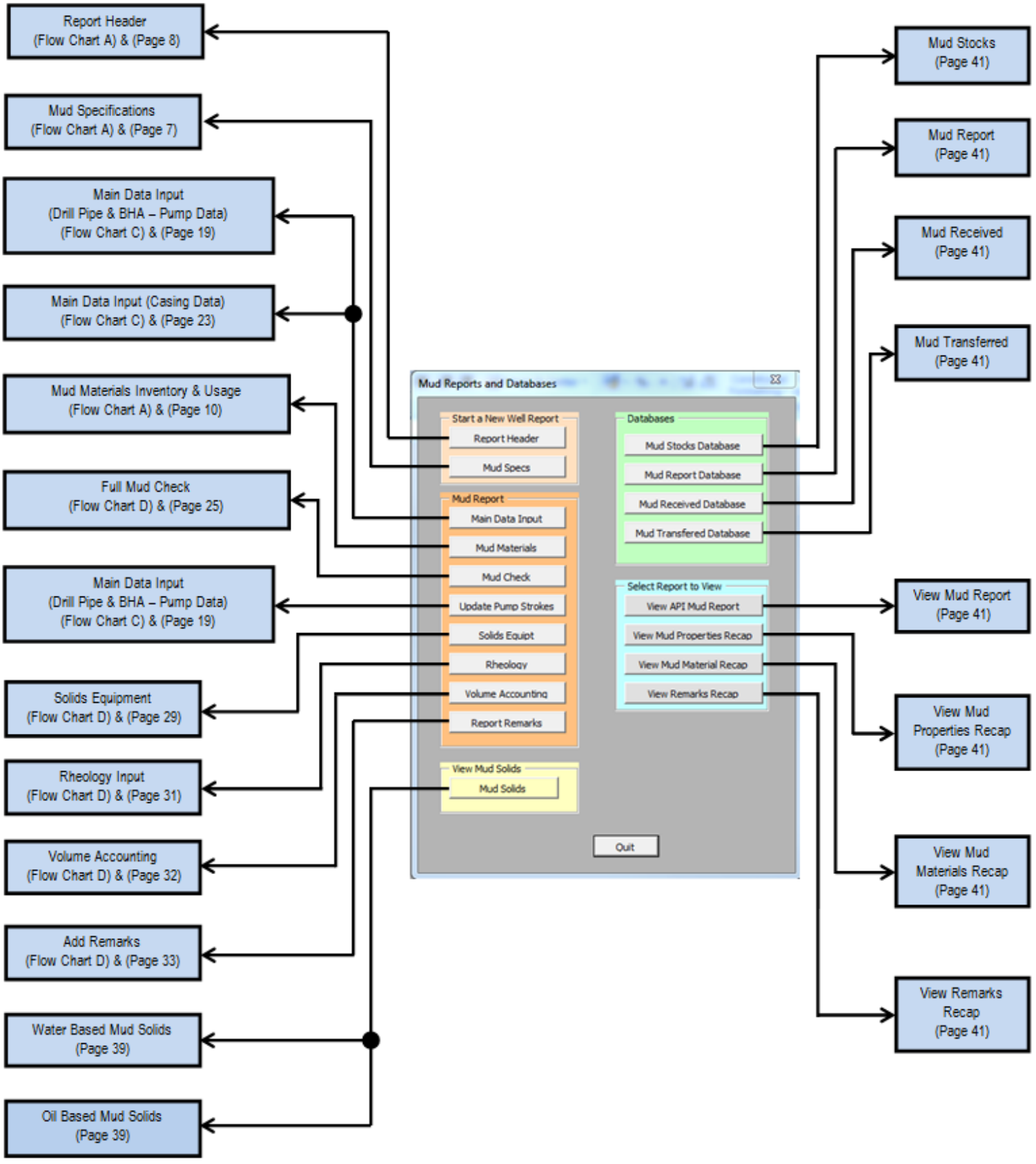
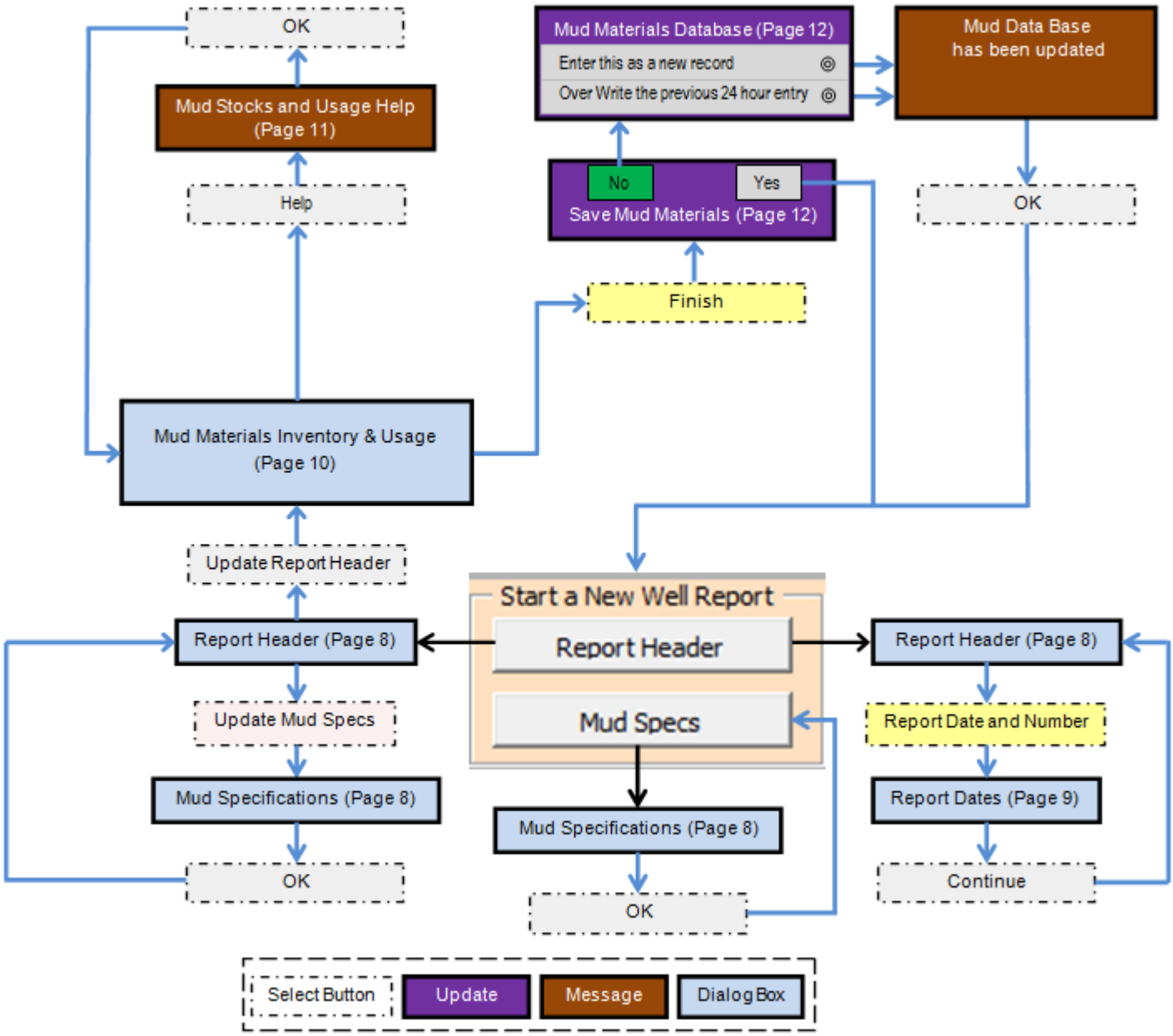


Figure 6 Mud Reports and Databases Menu Button Functions

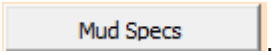
(1) Start a New Well Report.

In this section of the Mud Reports and Databases Menu, the Report Header and the Mud Specs dialog boxes are accessed. Flow Chart A and Flow Chart B (Start a New Well Report) are to help the mud engineer navigate this section of the program.



Flow Chart A: Start a New Well Report

(a) Mud Specs

On the Mud Reports and Databases Menu, select 

. The Mud Specifications dialog box is shown (Ref. Figure 7).

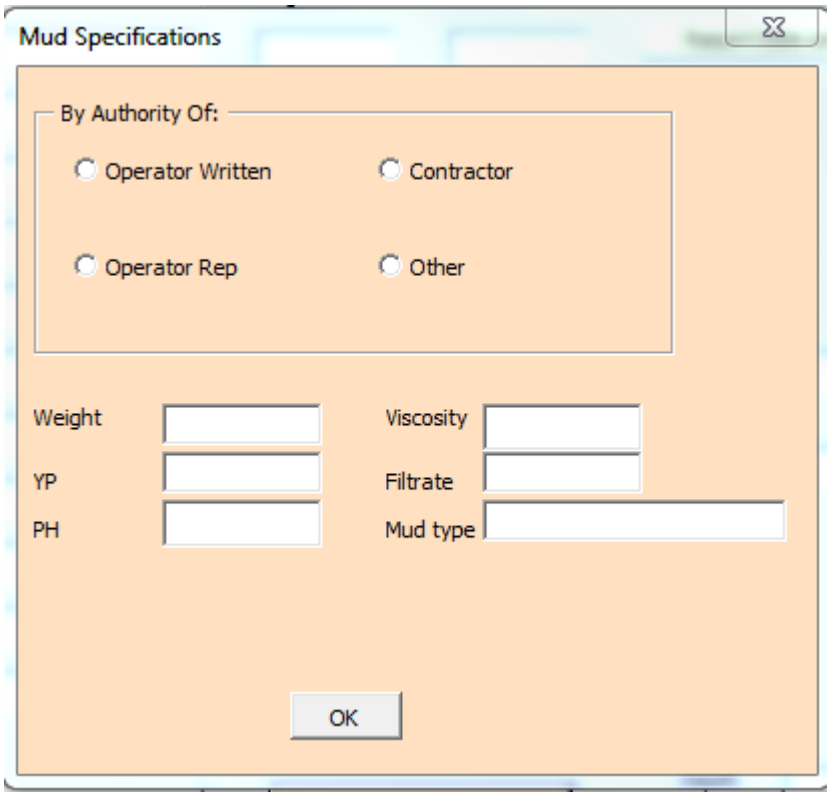


Figure 7 Mud Specifications

Selecting OK, after entering the appropriate data, returns the program to the Mud Reports and Databases Menu.

(b) Report Header

On the Mud Reports and Databases Menu, select Report Header. The Report Header dialog box is shown (Ref. Figure 8).

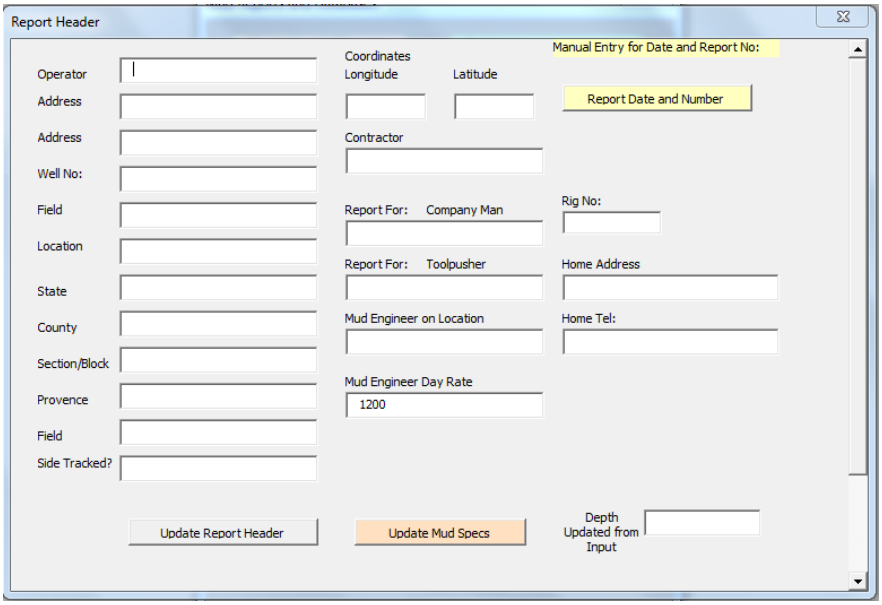


Figure 8 Report Header

All the information relating to the well is entered on the Report Header data input form.

1. Report Dates

On the Report Header dialog box, select Report Date and Number. The Report Dates dialog box is shown (Ref. Figure 9).

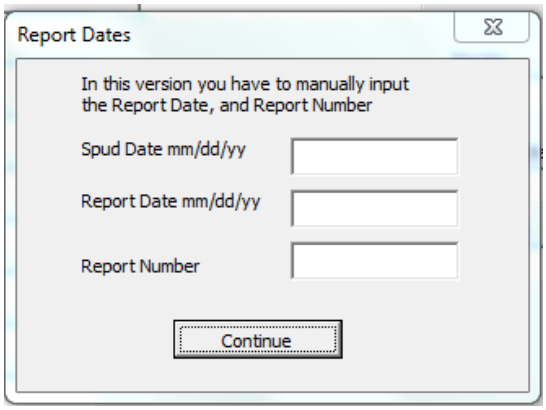


Figure 9 Report Dates

The Spud Date, Report Date and Report Number are entered manually.

When Continue is selected, the program returns to the Report Header dialog box.

2. Update Mud Specs

On the Report Header dialog box, select Update Mud Specs. The Mud Specifications dialog box is shown (Ref. Figure 7).

After the appropriate data has been entered or edited, selecting OK returns the program to the Report Header dialog box (Ref. Figure 8).

3. Mud Materials Inventory & Usage

On the Report Header dialog box, select Update Report Header. The Mud Materials & Usage dialog box is shown (Ref. Figure10).

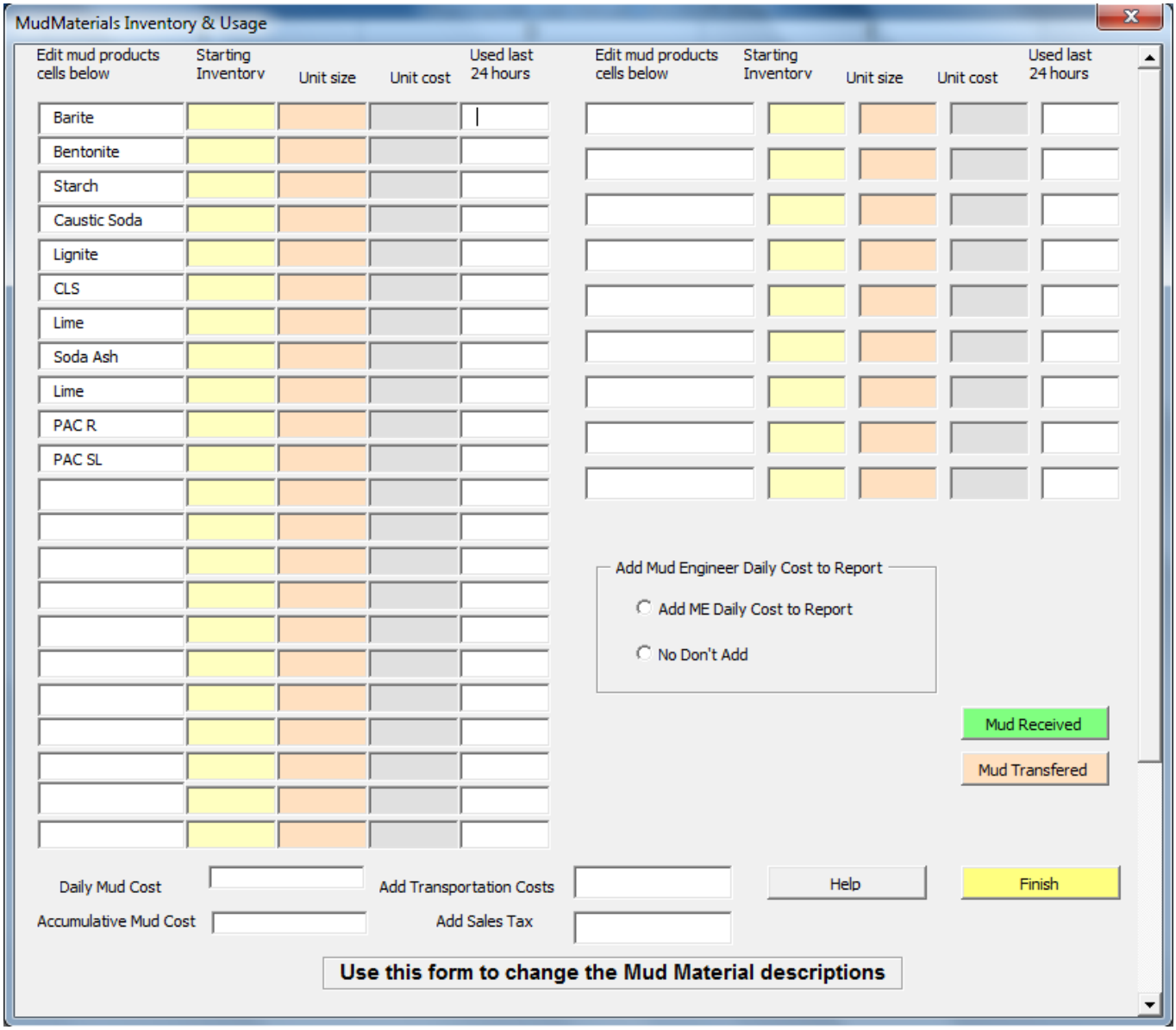
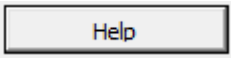


Figure 10 Mud Materials Inventory & Usage

The Mud Materials Inventory & Usage dialog box is used to input all the mud materials, their costs, quantities and daily usage.

a. Help

Selecting 

on the Mud Materials Inventory & Usage dialog box shows the Mud Stocks and Usage Help page (Ref. Figure 11)

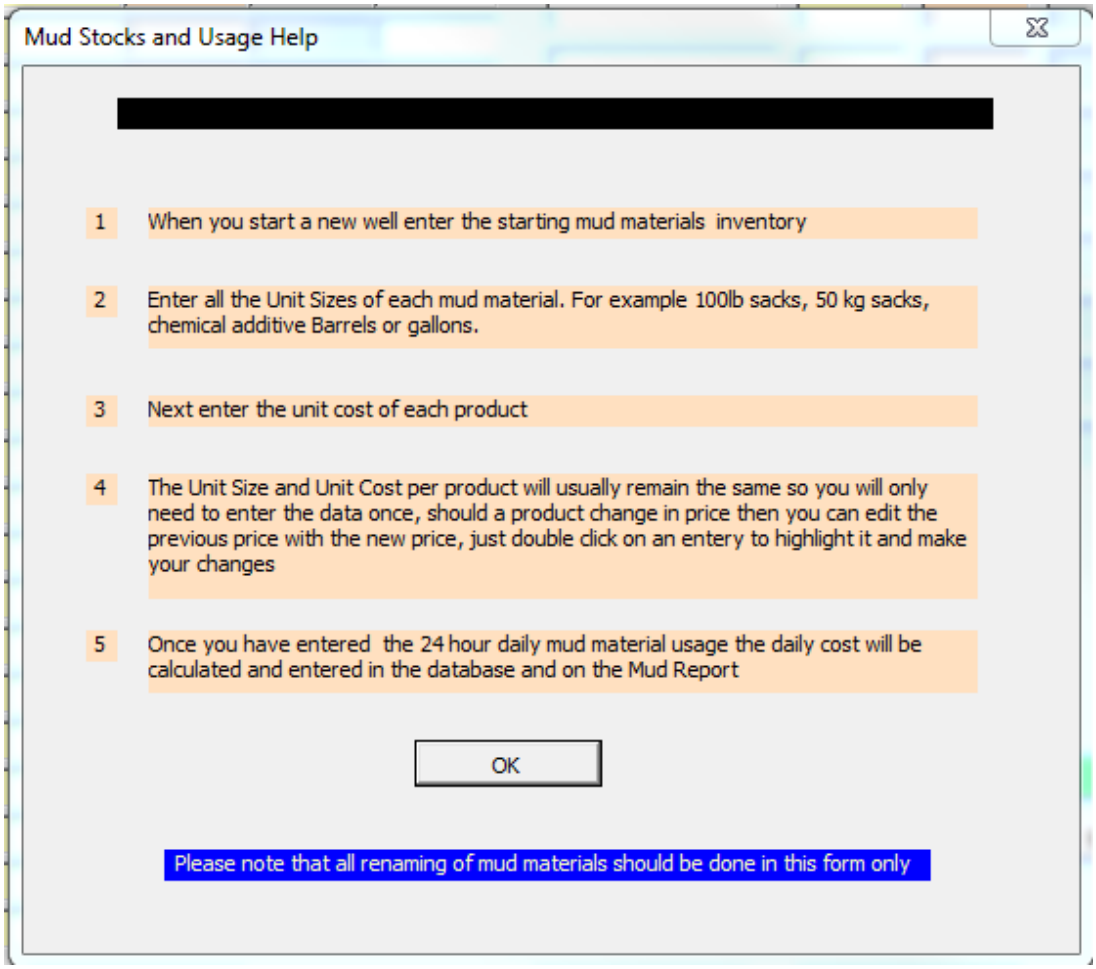
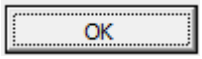


Figure 11 Mud Stocks and Usage Help

This page provides a guide on how to utilize the Mud Materials & Usage dialog box.

Select 

. The program returns to the Mud Materials Inventory & Usage dialog box.

b. Database Update

After entering/editing the data on Mud Materials Inventory & Usage dialog box, select Finish. The Save Mud Materials Update box is shown (Ref. Figure 12).

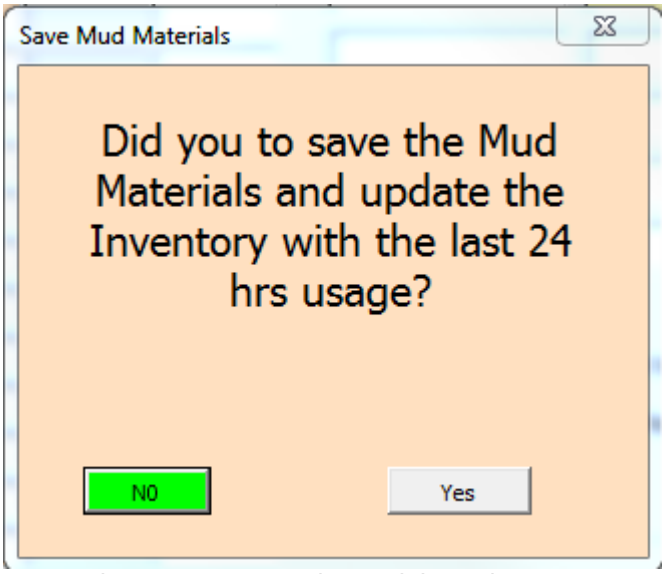


Figure 12 Save Mud Materials Update

Selecting Yes in the update box returns the program to the Mud Reports and Databases Menu (Ref. Figure 5).

Selecting N0 in the update box shows the Mud Materials DataBase update box (Ref. Figure 13).

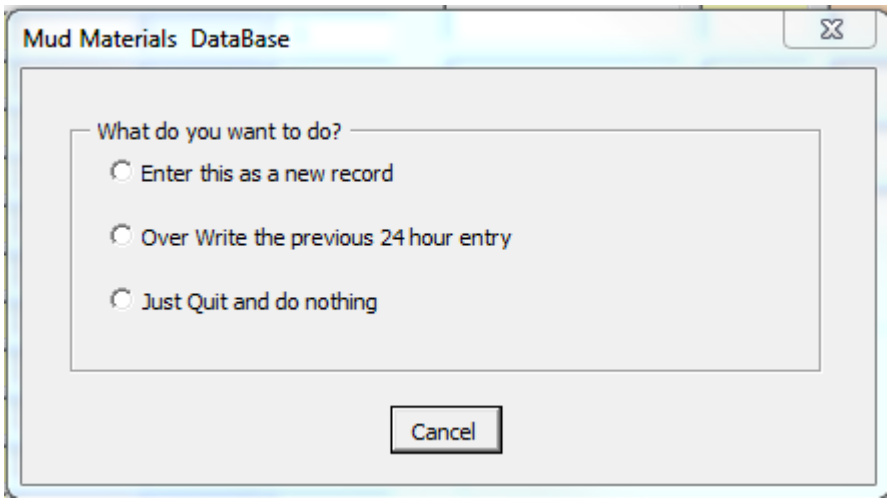


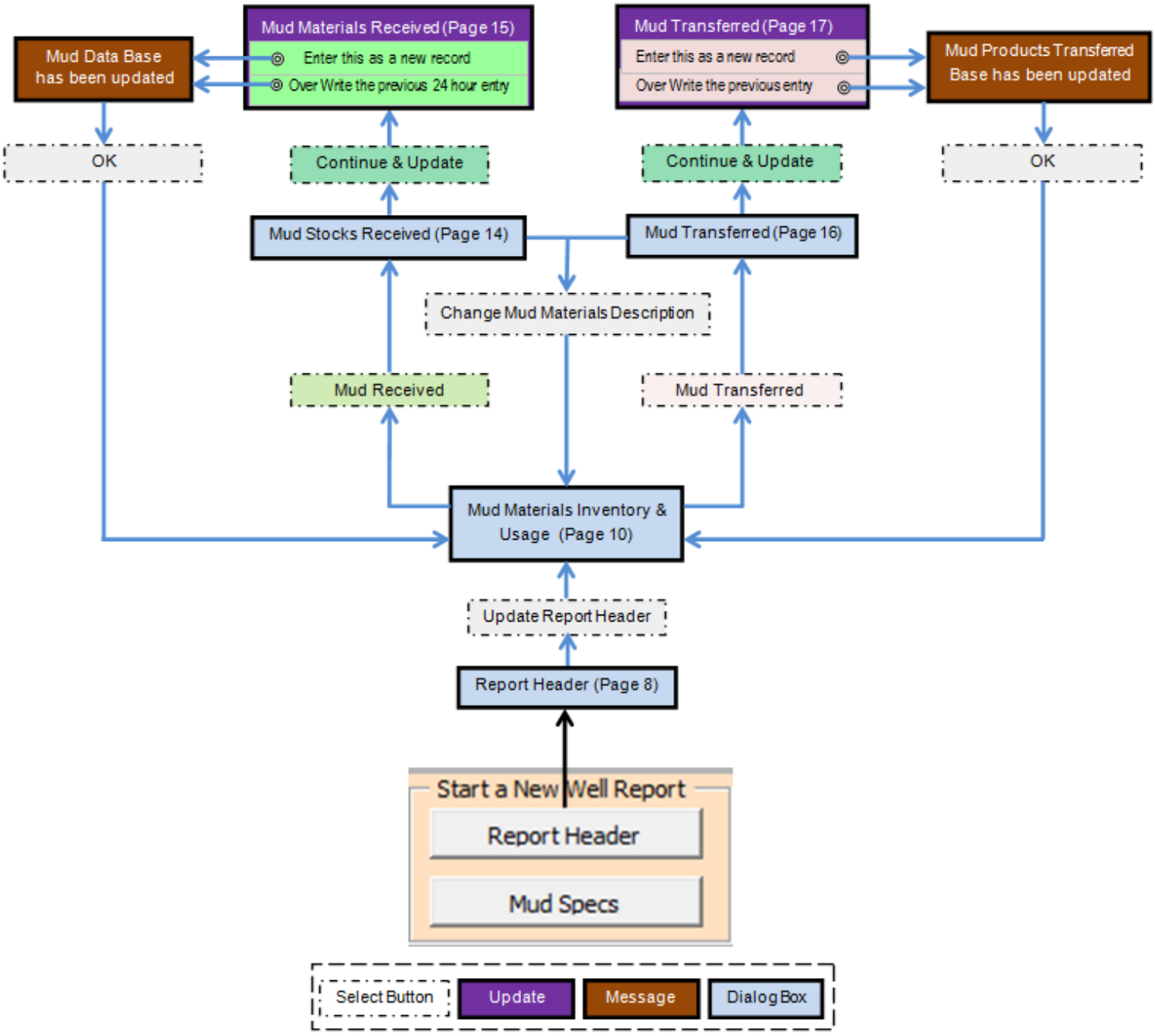
Figure 13 Mud Materials Database Update

Selecting Enter this as a new record updates the mud materials database with the previously entered data. A message is shown indicating that the mud materials data base has been updated.

Selecting OK, in this message box, returns the program to the Mud Reports and Databases Menu (Ref. Figure 5).

Selecting Over Write the previous 24 hour entry up dates and overwrites the previous 24 hour entry. A message is shown indicating that the mud materials data base has been updated.

Selecting OK, in this message box, returns the program to the Mud Reports and Databases Menu (Ref. Figure 5).



Flow Chart B: Start a New Well Report

c. Mud Stocks Received

On the Mud Materials Inventory & Usage dialog box (Ref. Figure 10), selecting Mud Received shows the Mud Stocks Received dialog box (Ref. Figure 14).

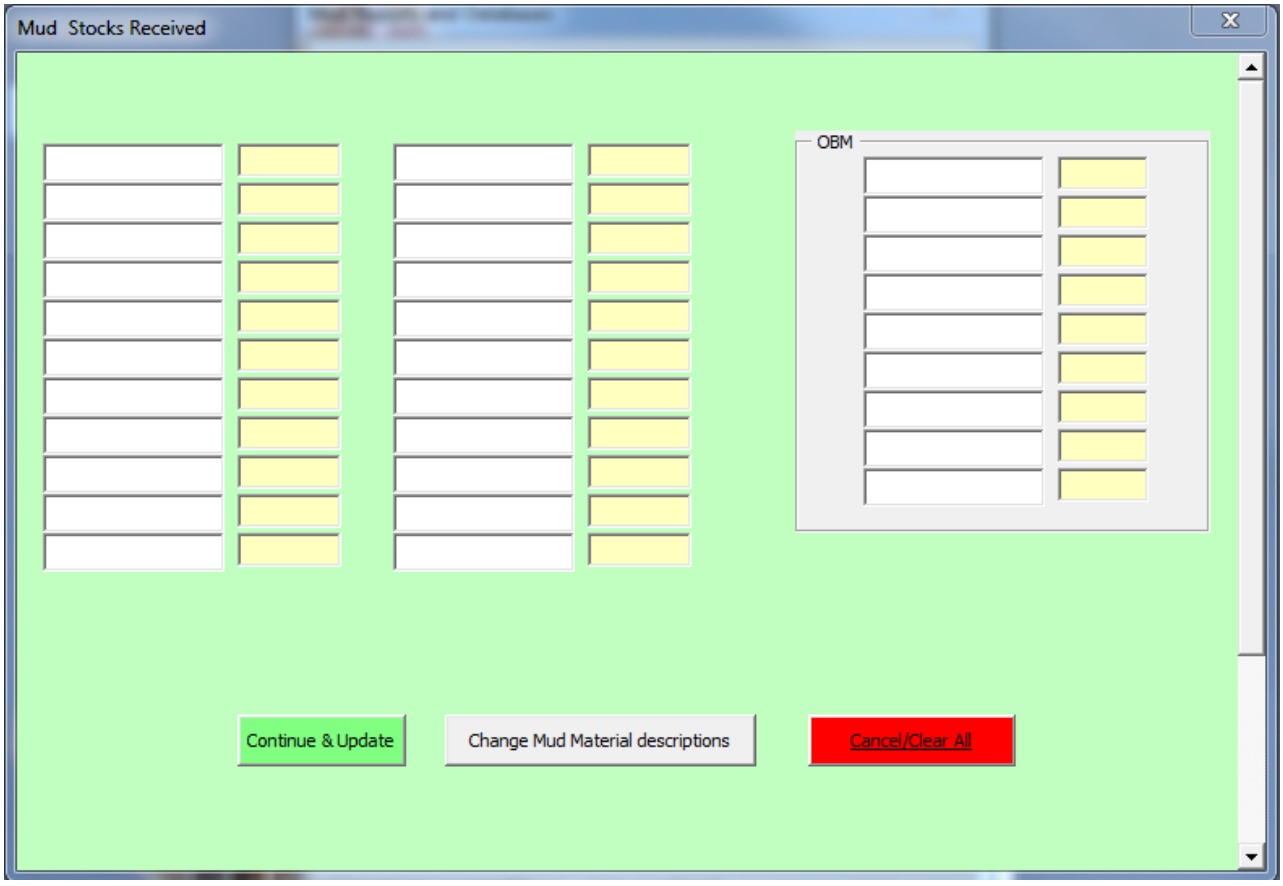


Figure 14 Mud Stocks Received

This dialog box is used to update the mud stock inventory.

Selecting Cancel/Clear All clears all the existing data.

If new mud materials are to be added, selecting Change Mud Material descriptions shows the Mud Materials Inventory & Usage dialog box (Ref. Figure 10). In this dialog box, new mud materials can be added, or existing mud materials can be edited.

Select Mud Received in the Mud Materials Inventory & Usage dialog box. The program returns to the Mud Stocks Received dialog box with the new or edited mud materials added to the Mud Stocks Received dialog box.

After entering any new data, select Continue & Update. The Mud Materials Received update box is shown (Ref. Figure 15).

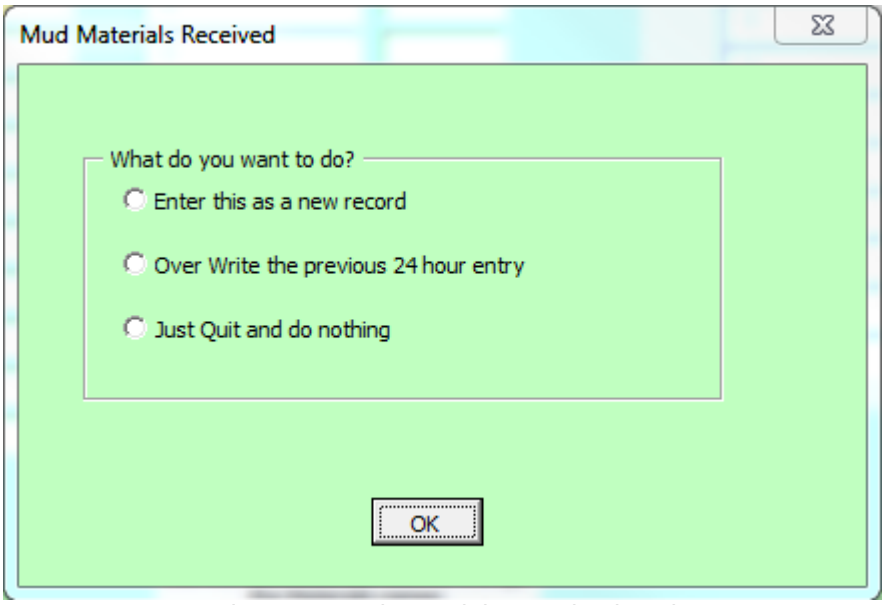
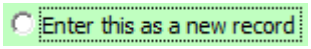
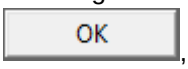
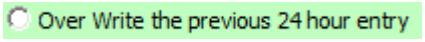
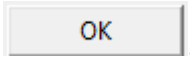


Figure 15 Mud Materials Received Update

Selecting  updates the mud materials received data base. A message is shown indicating the mud materials received data base has been updated.

Selecting  , in this message box, returns the program to the Mud Materials Inventory & Usage dialog box (Ref. Figure 10).

Selecting  overwrites and updates the previous 24 hour entry. A message is shown indicating that the mud materials received data base has been updated.

Selecting  , in this message box, returns the program to the Mud Materials Inventory & Usage dialog box (Ref. Figure 10).

d. Mud Stocks Transferred

Selecting Mud Transfered on the Mud Materials Inventory & Usage dialog box (Ref. Figure 10) shows the Mud Transferred dialog box (Ref. Figure 16).

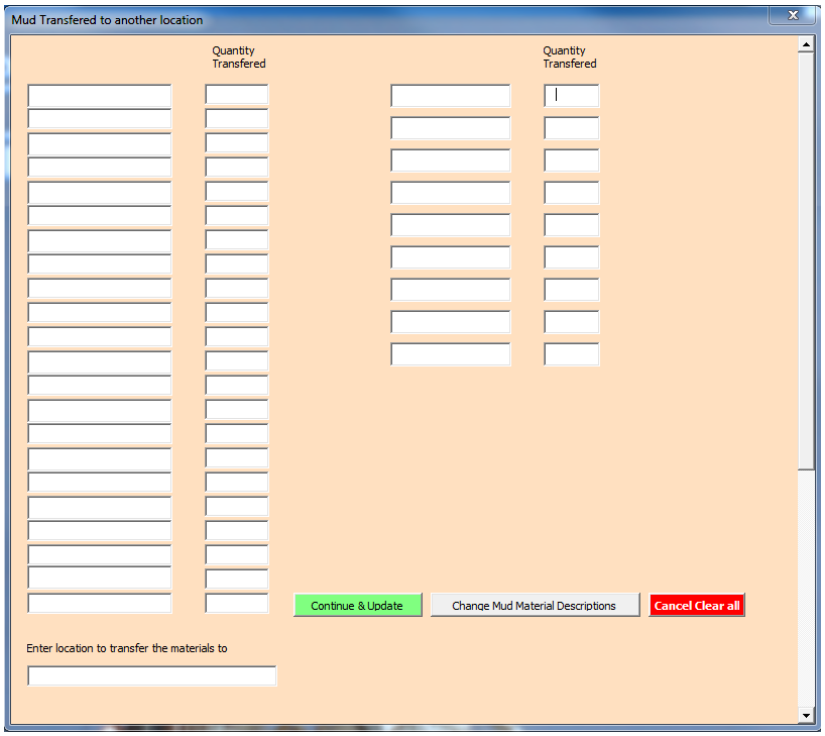


Figure 16 Mud Transferred

This dialog box is used to update the mud stocks transferred inventory.

Selecting Cancel/Clear All clears all the existing data.

When new mud materials are to be added, selecting Change Mud Material descriptions shows the Mud Materials Inventory & Usage dialog box (Ref. Figure 10). On this dialog box, new mud materials can be inserted, or existing mud materials can be edited.

Select Mud Transfered on the Mud Materials Inventory & Usage dialog box. The program returns to the Mud Transferred dialog box with the new or edited mud materials added to the Mud Transferred dialog box.

After the new data has been entered, select Continue & Update. The Mud Products Transferred Database update box is shown (Ref. Figure 17).

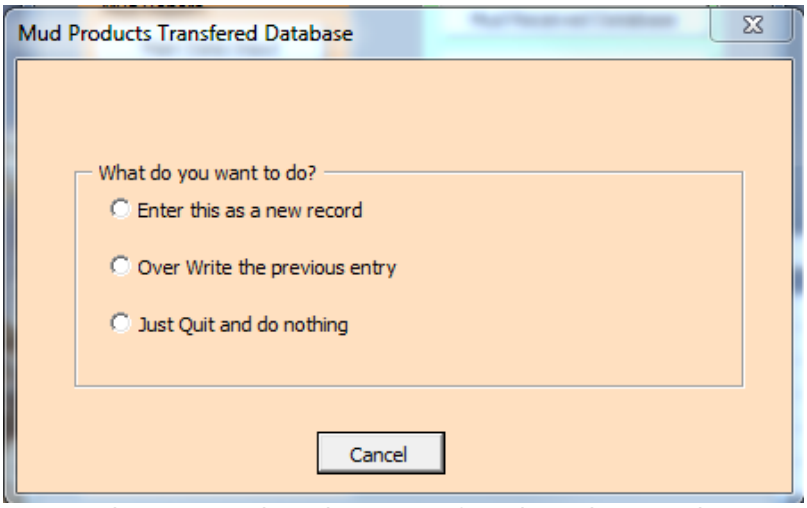


Figure 17 Mud Products Transferred Database Update

Selecting Enter this as a new record updates the mud products transferred data base. A message is shown indicating that the mud products transferred data base has been updated.

Selecting OK, in this message box, returns the program to the Mud Materials Inventory & Usage dialog box (Ref. Figure 10).

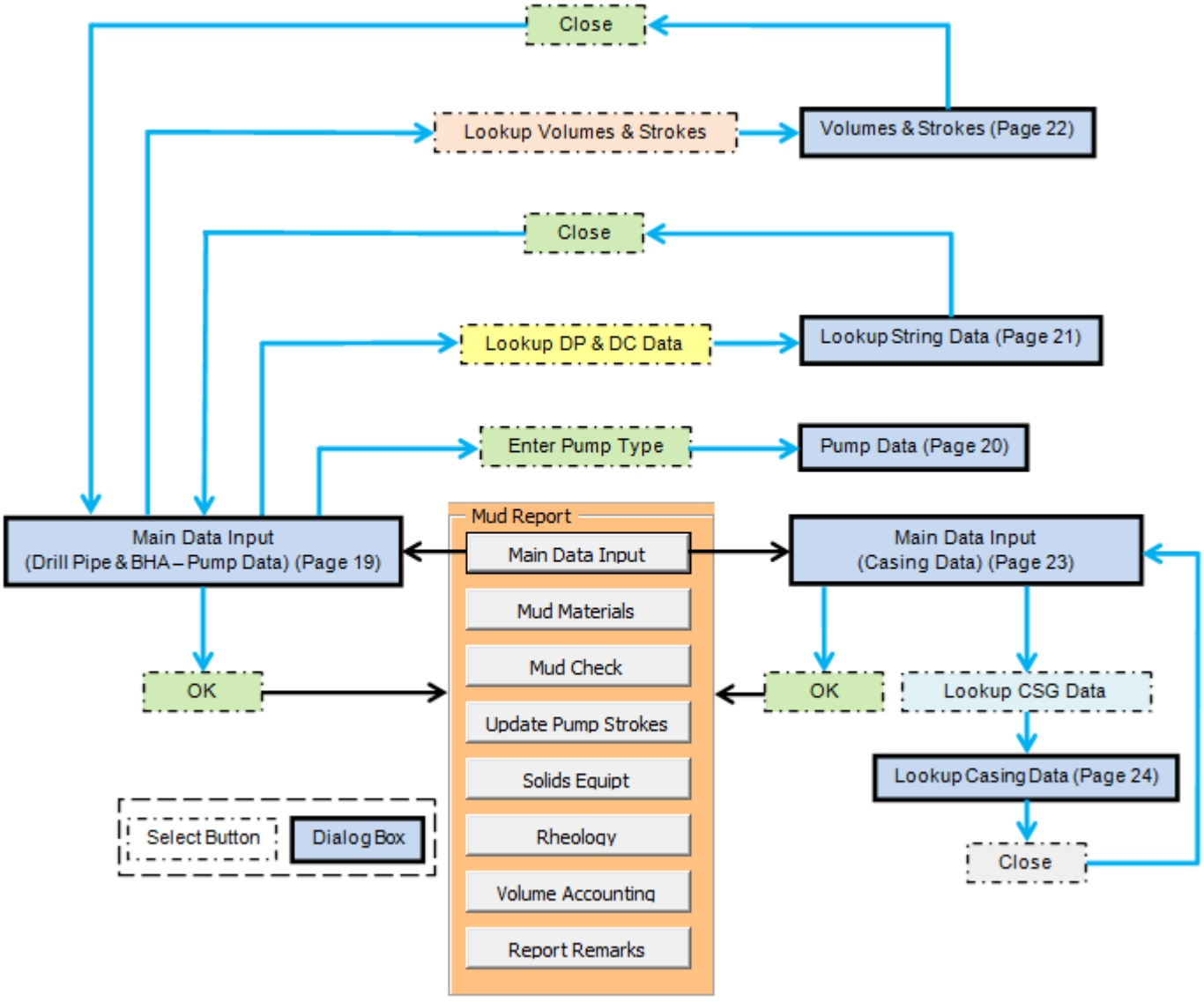
Selecting Over Write the previous entry overwrites and updates the previous 24 hour entry. A message is shown indicating that the mud products transferred data base has been updated.

Selecting OK, in this message box, returns the program to the Mud Materials Inventory & Usage dialog box (Ref. Figure 10).

(2) Mud Report

(a) Main Data Input

In this section of the Mud Reports and Databases Menu, the Main Dialog box is accessed. Flow Chart C (Main Data Input) is to help the mud engineer navigate this section of the program.



Flow Chart C: Main Data Input

On the Main Menu, select Main Data Input. The Main Data Input dialog box is shown with the Drill Pipe & BHA – Pump Data tab activated (Ref. Figure 18).

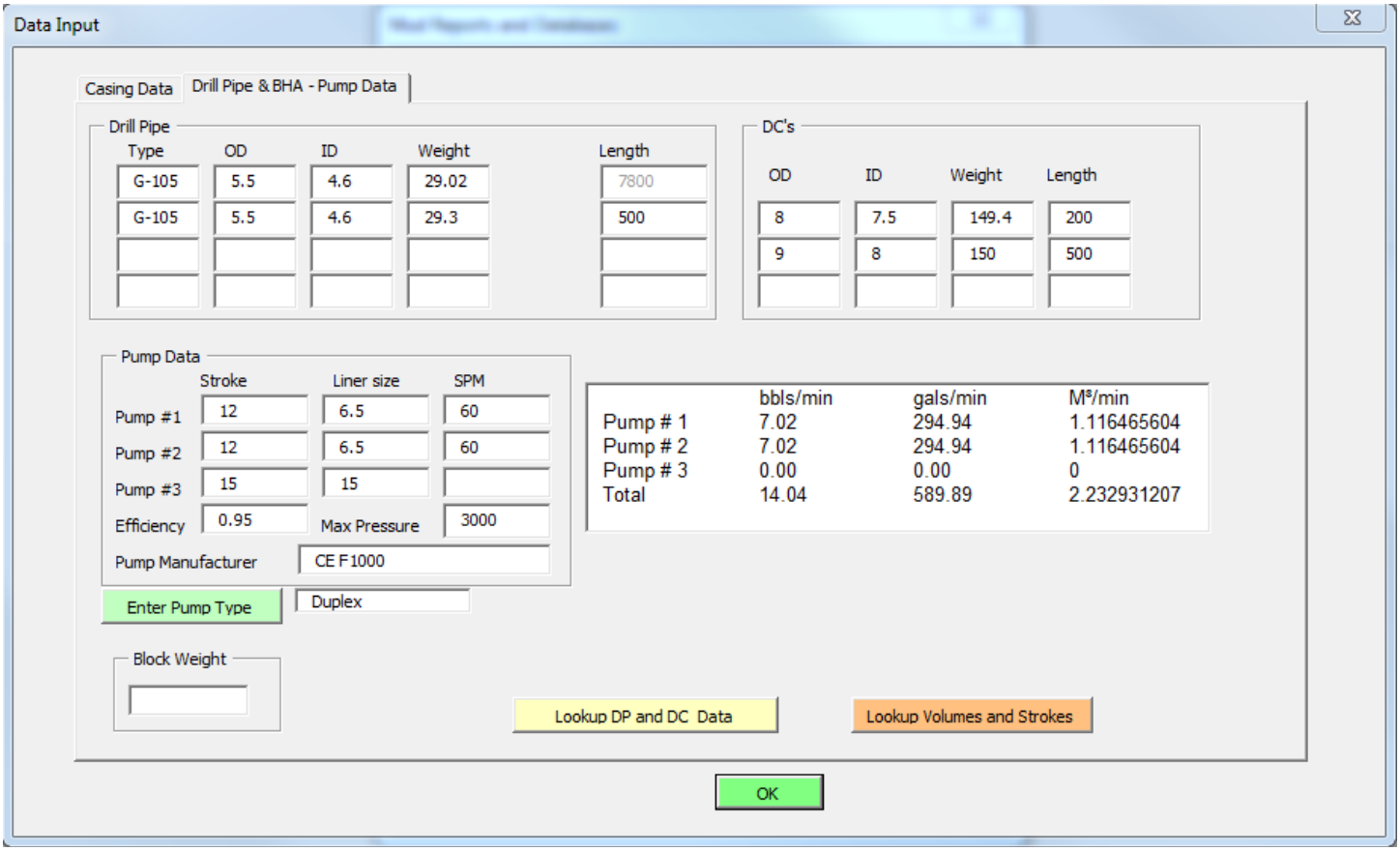


Figure 18 Main Data Input (Drill Pipe & BHA - Pump Data)

1. Drill Pipe &BHA – Pump Data

Data is entered in these dialog boxes

a. Drill Pipe:
- Type
- Outside Diameter (OD)
- Inside Diameter (ID)
- Weight
- Length.

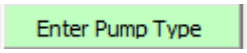
b. DC's:
- Outside Diameter (OD)
- Inside Diameter (ID)
- Weight
- Length.

c. Pump Data:
- Stroke
- Liner Size
- SPM
- Pump Manufacturer.

d. Block Weight.

The pump outputs are shown in the panel to the right of the Pump Data.

e. Pump Type

Selecting 

shows the Pump Data selection dialog box (Ref. Figure 19)

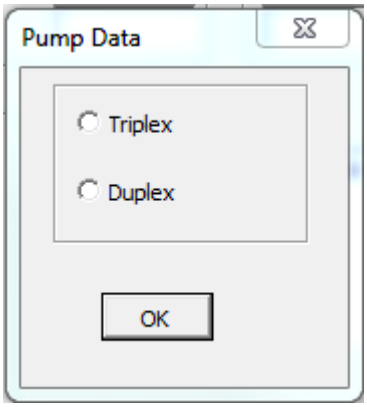


Figure 19 Pump Data Selection

Selecting 

returns the program to the Main Data Input (Drill Pipe & BHA – Pump Data) dialog box.

Selecting 

shows the Duplex Rod Size dialog box (Ref. Figure 20).

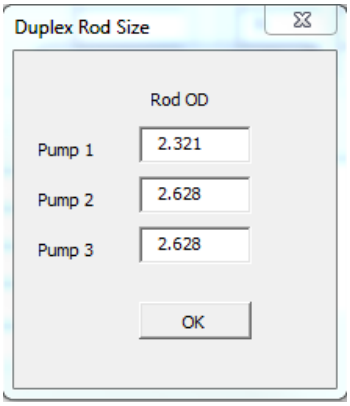
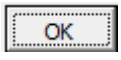


Figure 20 Duplex Rod Size

The rod Outside Diameter (OD) for each pump is entered on this dialog box.

Select 

after entering the data, the program returns to the Data Input (Drill Pipe & BHA – Pump Data) dialog box.

f. Look up String Data

Selecting [Lookup DP and DC Data] shows the Look up String data page (Ref. Figure 21). This page is for information only.

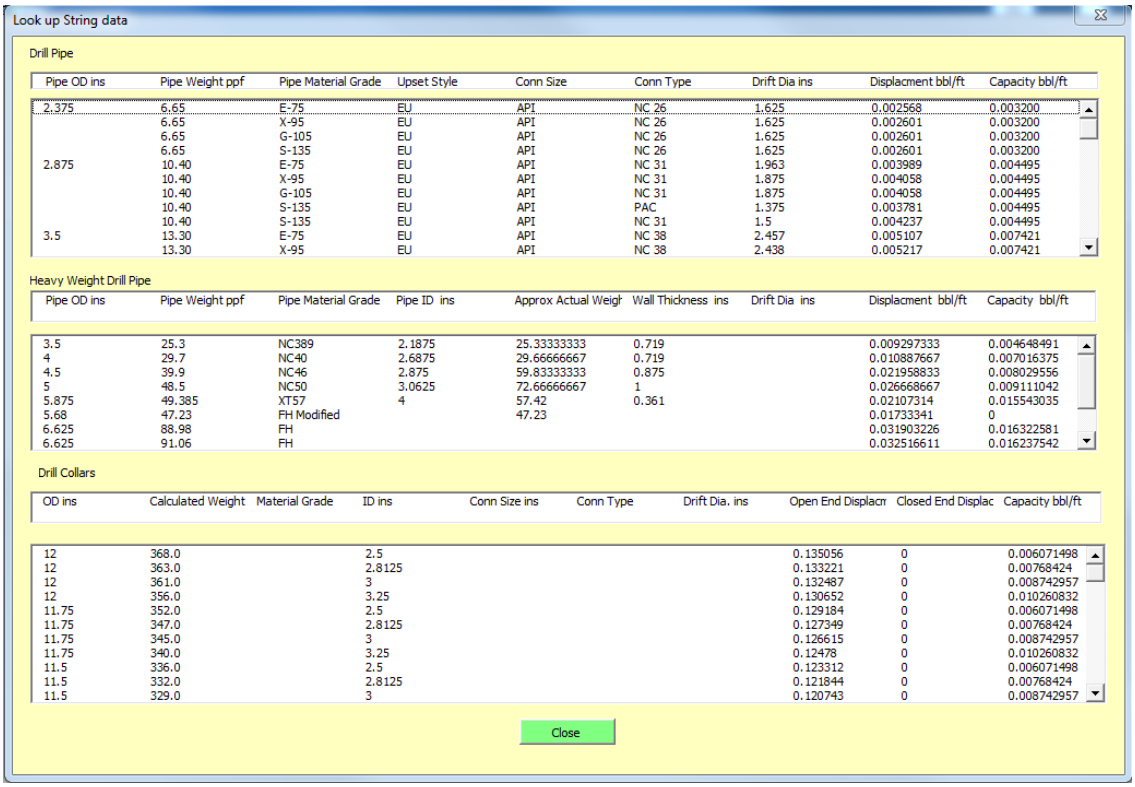


Figure 21 Lookup String Data

Selecting [Close] returns the program to the Main Data Input (Drill Pipe & BHA - Pump Data) dialog box.

g. Volumes and Strokes

Selecting [Lookup Volumes and Strokes] in the Main Data Input (Drill Pipe & BHA - Pump Data) dialog box shows the Volumes and Strokes page (Ref. Figure 22).

Figure 22 Volumes and Strokes

This page is mainly an information page. The hole washout calculation can be entered manually.

Selecting [Close] returns the program to the Main Data Input (Drill Pipe & BHA - Pump Data) dialog box.

Selecting [OK] on the Main Data Input (Drill Pipe & BHA - Pump Data) dialog box updates the applicable data base and returns the program to the Mud Reports and Databases Menu (Ref. Figure 5)

2. Casing Data

Selecting the Casing Data tab on the Main Data Input (Drill Pipe & BHA - Pump Data) dialog box shows the Main Data Input (Casing Data) dialog box (Ref. Figure 23)

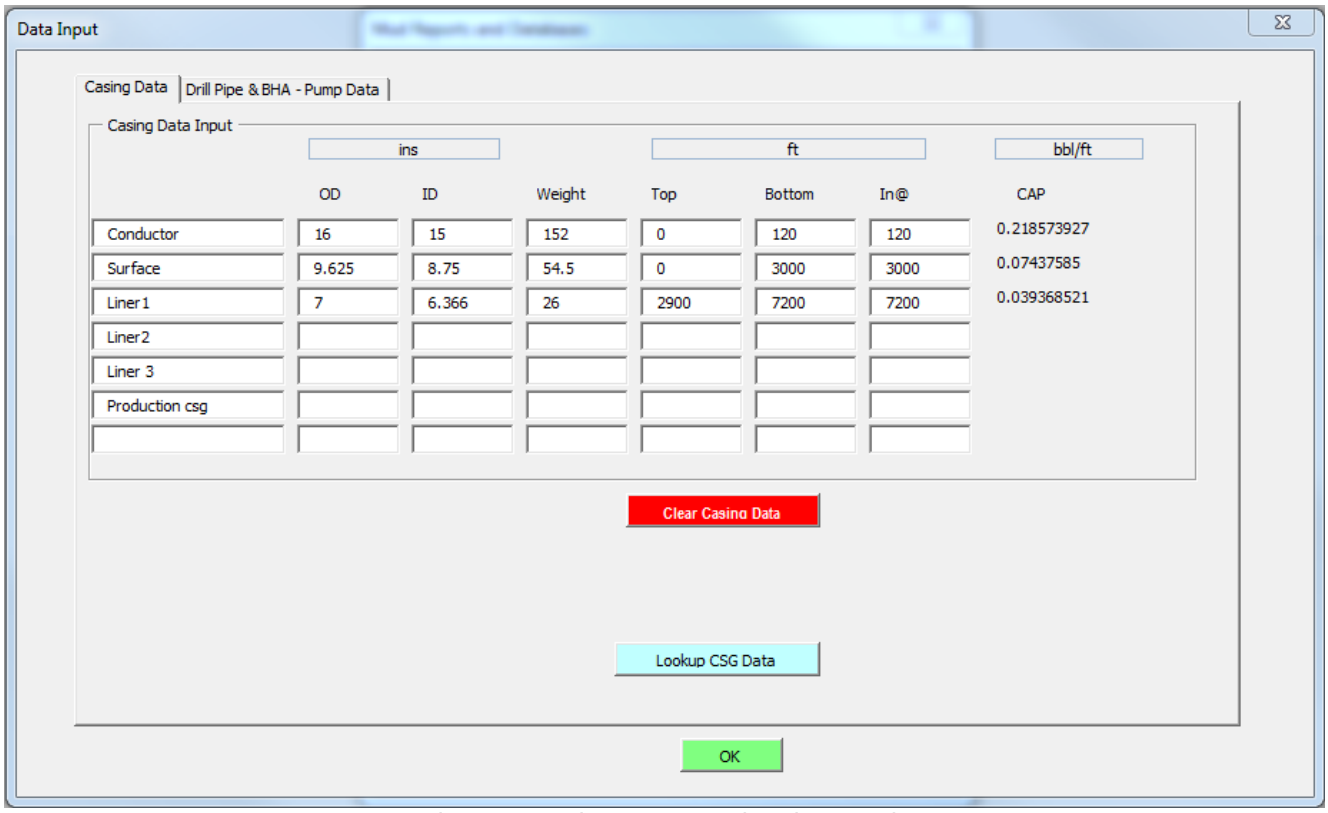


Figure 23 Main Data Input (Casing Data)

a. Clear Casing Data

Selecting Clear Casing Data clears any existing casing data.
Any data relating to:
- Conductor
- Surface
- Liner 1
- Liner 2
- Liner 3
- Production csg

is entered in the applicable dialog box.

Selecting OK updates the data base and returns the program to the Mud Reports and Databases Menu (Ref. Figure 5).

b. Lookup CSG Data

Selecting [Lookup CSG Data] an information page, with the casing data, is shown (Ref. Figure 24).

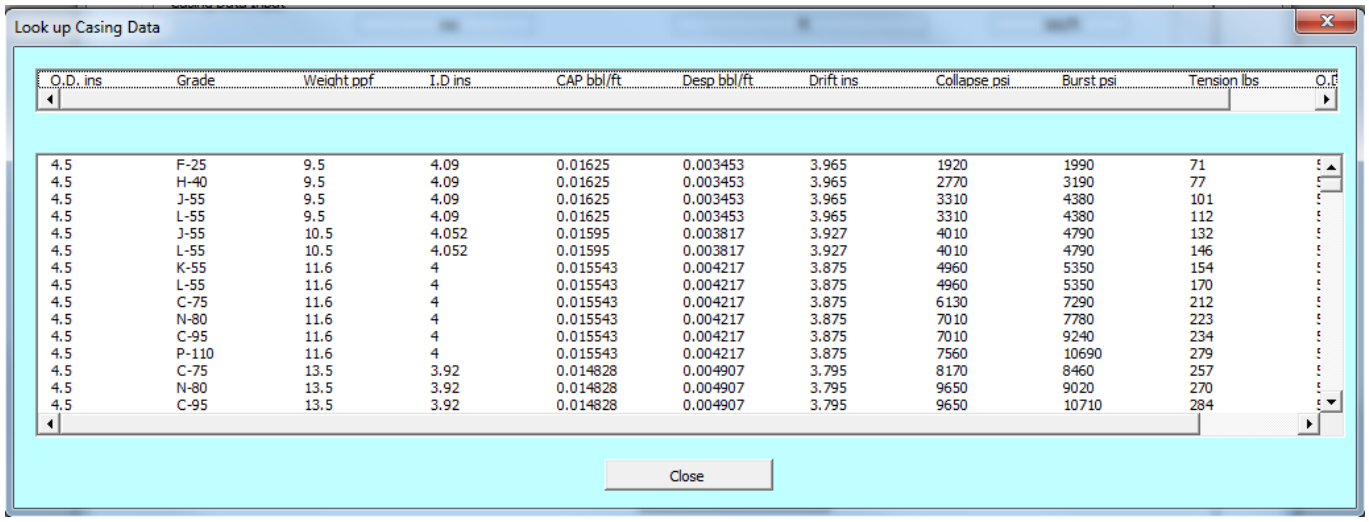


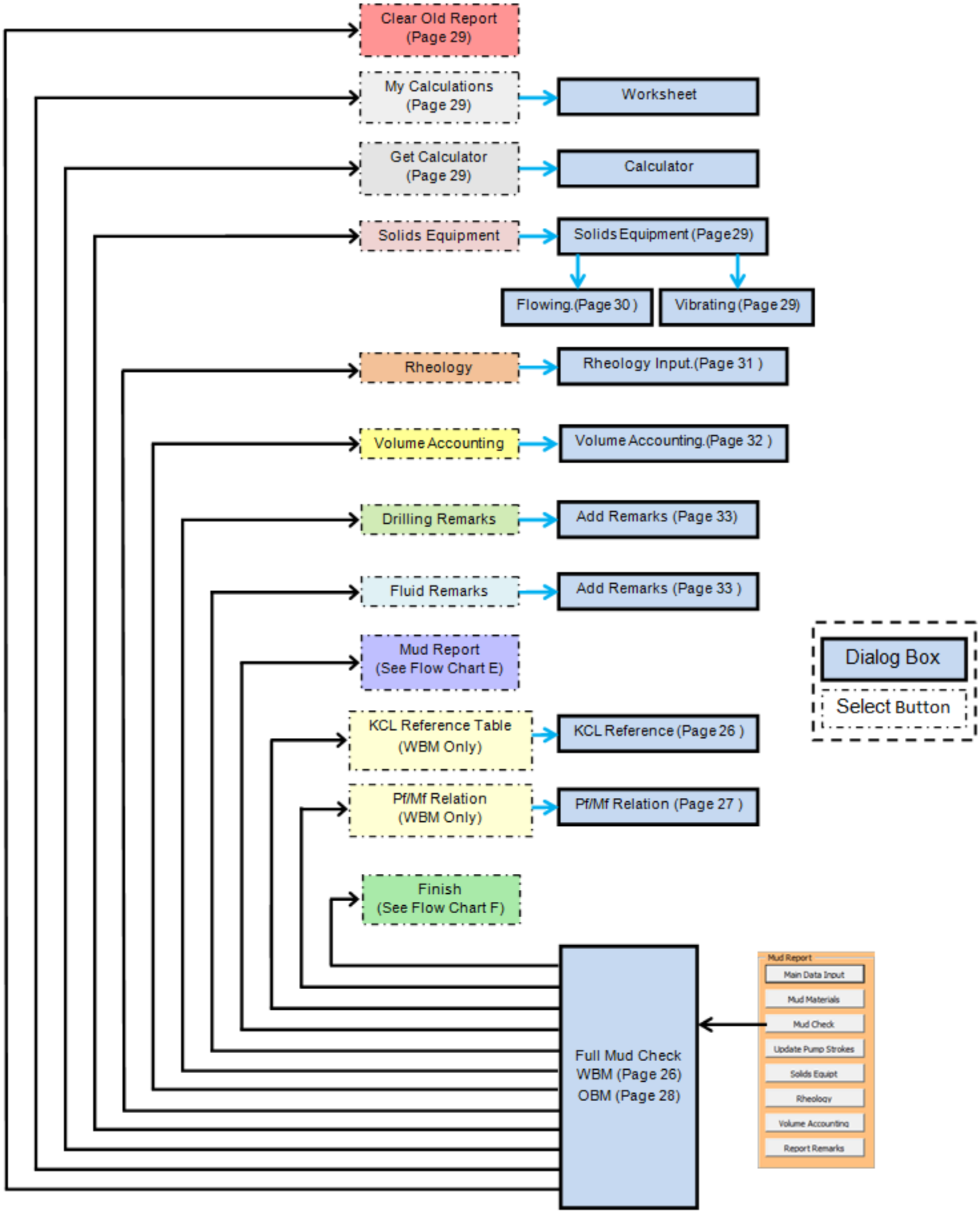
Figure 24 Casing Data

Selecting [Close] returns the program to the Main Data Input (Casing Data) dialog box.

Selecting [OK] updates the applicable data base and returns the program to the Mud Reports and Databases Menu (Ref. Figure 5).

(b) Mud Check

In this section of the Mud Reports and Databases Menu, the Full Mud Check dialog box is accessed. Flow Chart D (Full Mud Check) is to help the mud engineer navigate this section of the program.



Flow Chart D: Full Mud Check

On the Mud Reports and Databases Menu (Ref. Figure 5), select Mud Check. The Full Mud Check dialog box is shown with the Water Base Mud tab activated (Ref. Figure 25).

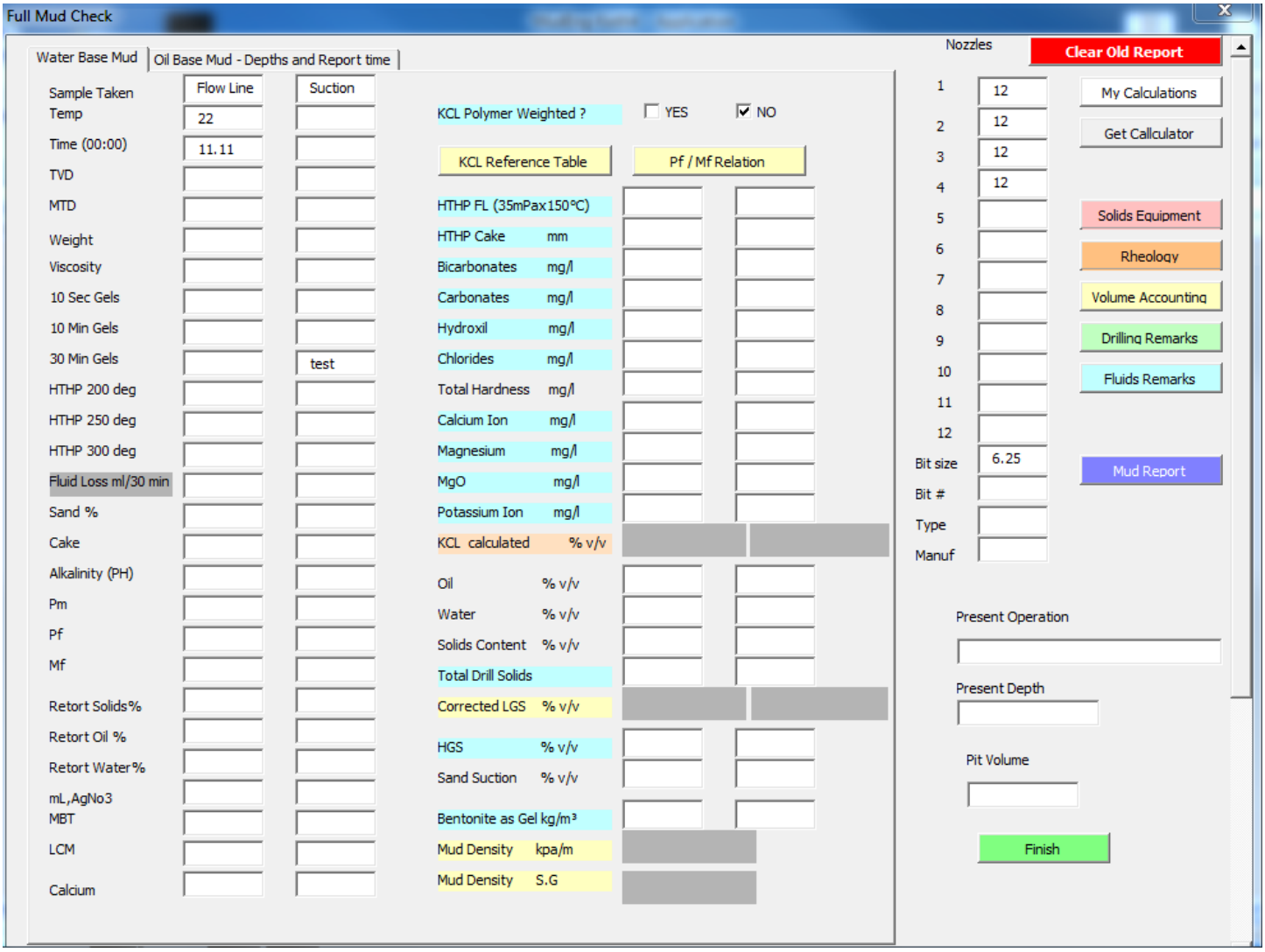


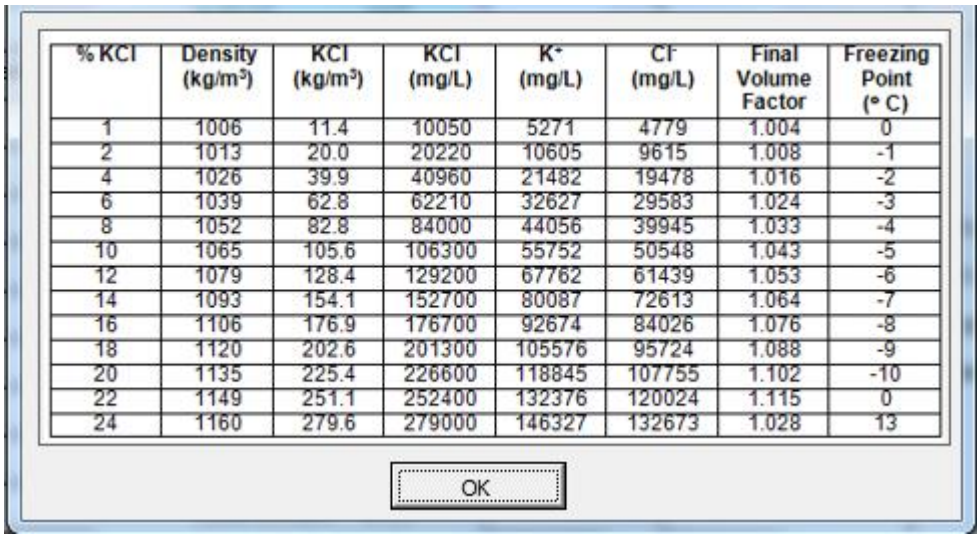
Figure 25 Full Mud Check (Water Base Mud)

1. Water Base Mud

All factors relating to the water base mud are entered in this dialog box.

a. KCL Reference

Selecting KCL Reference Table shows the KCL Reference table (Ref. Figure 26).



% KCl	Density (kg/m³)	KCl (kg/m³)	KCl (mg/L)	K⁺ (mg/L)	Cl⁻ (mg/L)	Final Volume Factor	Freezing Point (° C)
1	1006	11.4	10050	5271	4779	1.004	0
2	1013	20.0	20220	10605	9615	1.008	-1
4	1026	39.9	40960	21482	19478	1.016	-2
6	1039	62.8	62210	32627	29583	1.024	-3
8	1052	82.8	84000	44056	39945	1.033	-4
10	1065	105.6	106300	55752	50548	1.043	-5
12	1079	128.4	129200	67762	61439	1.053	-6
14	1093	154.1	152700	80087	72613	1.064	-7
16	1106	176.9	176700	92674	84026	1.076	-8
18	1120	202.6	201300	105576	95724	1.088	-9
20	1135	225.4	226600	118845	107755	1.102	-10
22	1149	251.1	252400	132376	120024	1.115	0
24	1160	279.6	279000	146327	132673	1.028	13

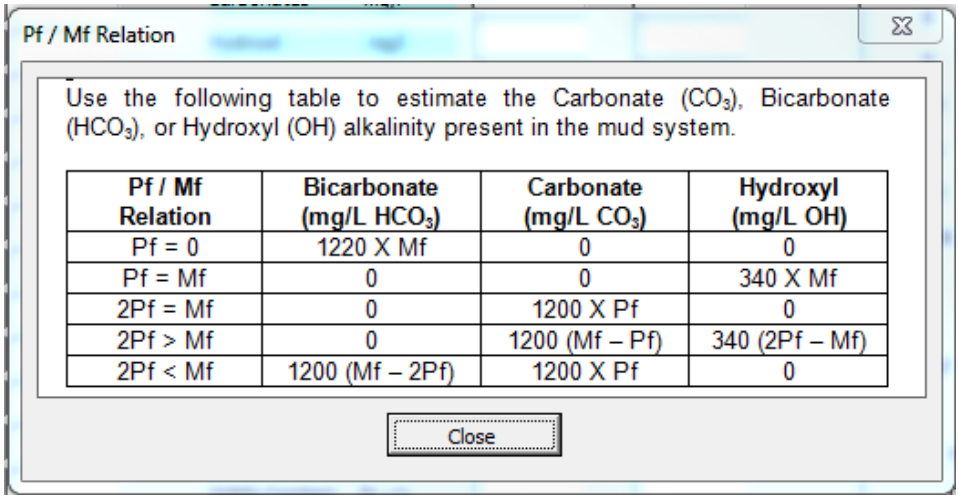
OK

Figure 26 KCL Reference Table

Selecting OK returns the program to the Full Mud Check (Water Base Mud) dialog box.

b. Pf/Mf Relation

Selecting Pf / Mf Relation shows the Pf/Mf Relation Chart (Ref. Figure 27).



Pf / Mf Relation

Use the following table to estimate the Carbonate (CO_3), Bicarbonate (HCO_3), or Hydroxyl (OH) alkalinity present in the mud system.

Pf / Mf Relation	Bicarbonate (mg/L HCO_3)	Carbonate (mg/L CO_3)	Hydroxyl (mg/L OH)
Pf = 0	1220 X Mf	0	0
Pf = Mf	0	0	340 X Mf
2Pf = Mf	0	1200 X Pf	0
2Pf > Mf	0	1200 (Mf – Pf)	340 (2Pf – Mf)
2Pf < Mf	1200 (Mf – 2Pf)	1200 X Pf	0

Close

Figure 27 Pf/Mf Relation

Selecting Close returns the program to the Full Mud Check (Water Base Mud) dialog box.

2. Oil Base Mud

Selecting the Oil Base Mud - Depths and Report time tab on the Full Mud Check (Water Base Mud) shows the Full Mud Check (Oil Base Mud) dialog box (Ref. Figure 28).

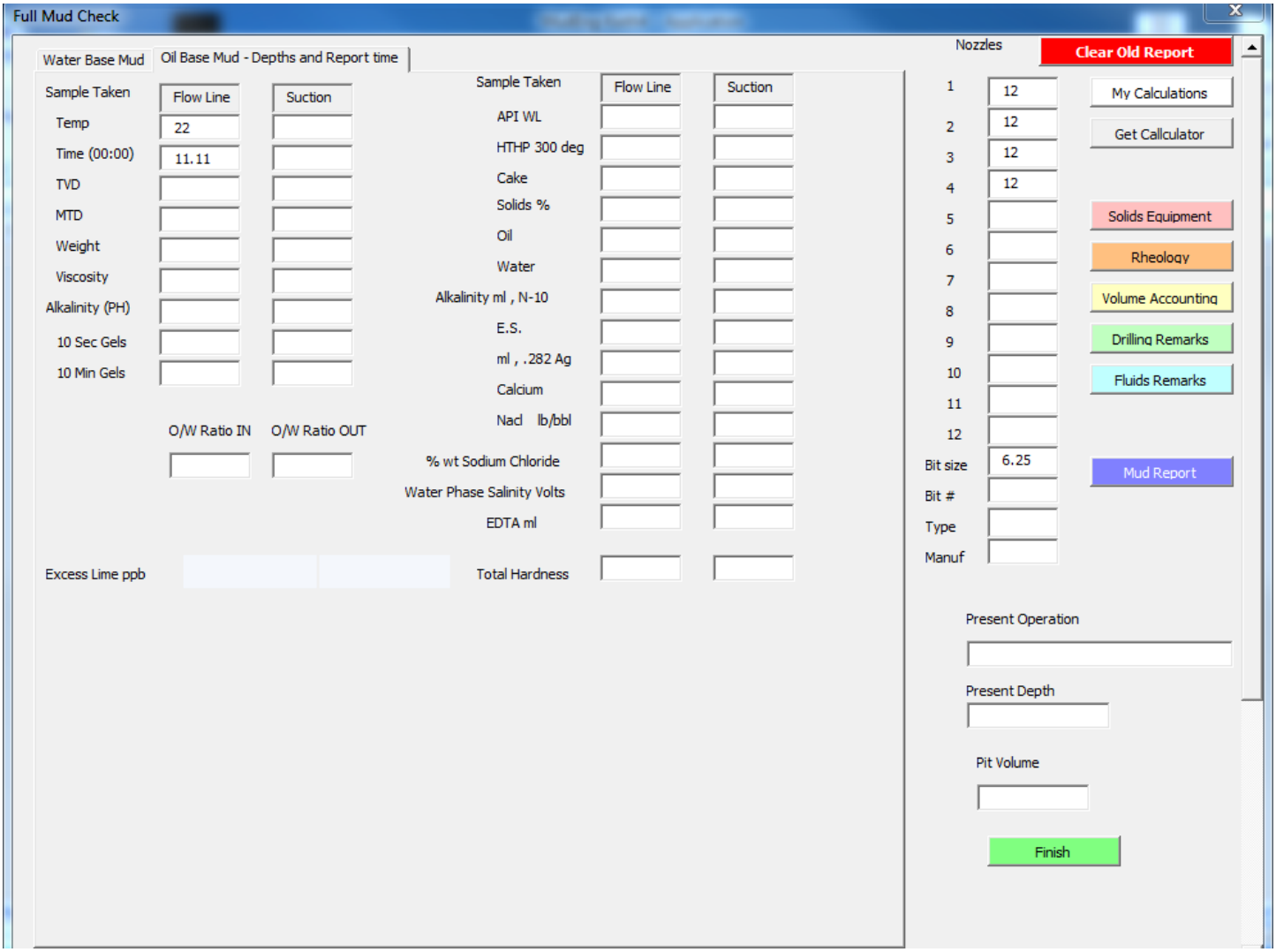


Figure 28 Full Mud Check (Oil Base Mud)

All factors relating to the water base mud are entered in this dialog box.

3. Water Base Mud and Oil Based Mud

The following functions are common to both the Water Base Mud and the Oil Base Mud dialog boxes.

a. Clear Old Report

Selecting Clear Old Report deletes the existing data.

b. Calculations

Selecting My Calculations shows a blank worksheet. Any personal calculations can be entered on this worksheet. Selecting Get Calculator on either the worksheet or the Full Mud Check dialog box shows a calculator.

Selecting Mud Check on the worksheet returns the program to the Full Mud Check dialog box.

c. Solids Equipment

Selecting Solids Equipment shows the Solids Equipment dialog box with the Vibrating tab activated (Ref. Figure 29).

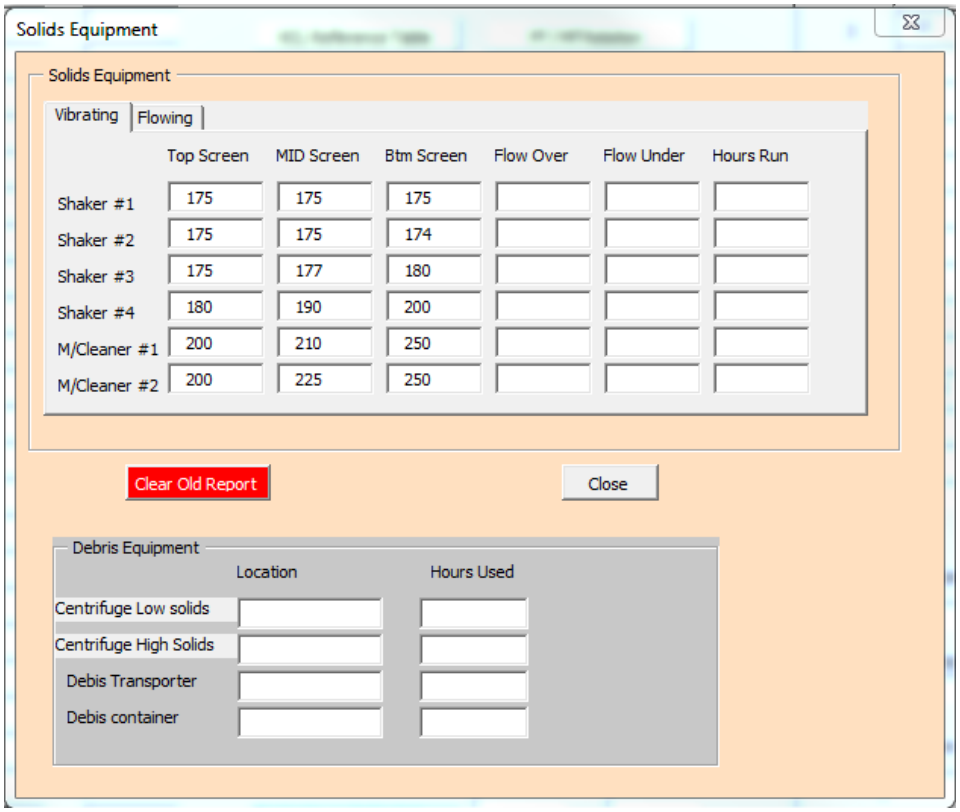


Figure 29 Solids Equipment (Vibrating)

Selecting Clear Old Report deletes the existing data. New data relating to the vibrating solids can now be entered.

Selecting Close saves the data and returns the program to the Full Mud Check dialog box.

Selecting the Flowing tab shows the flowing solids dialog box (Ref. Figure 30)

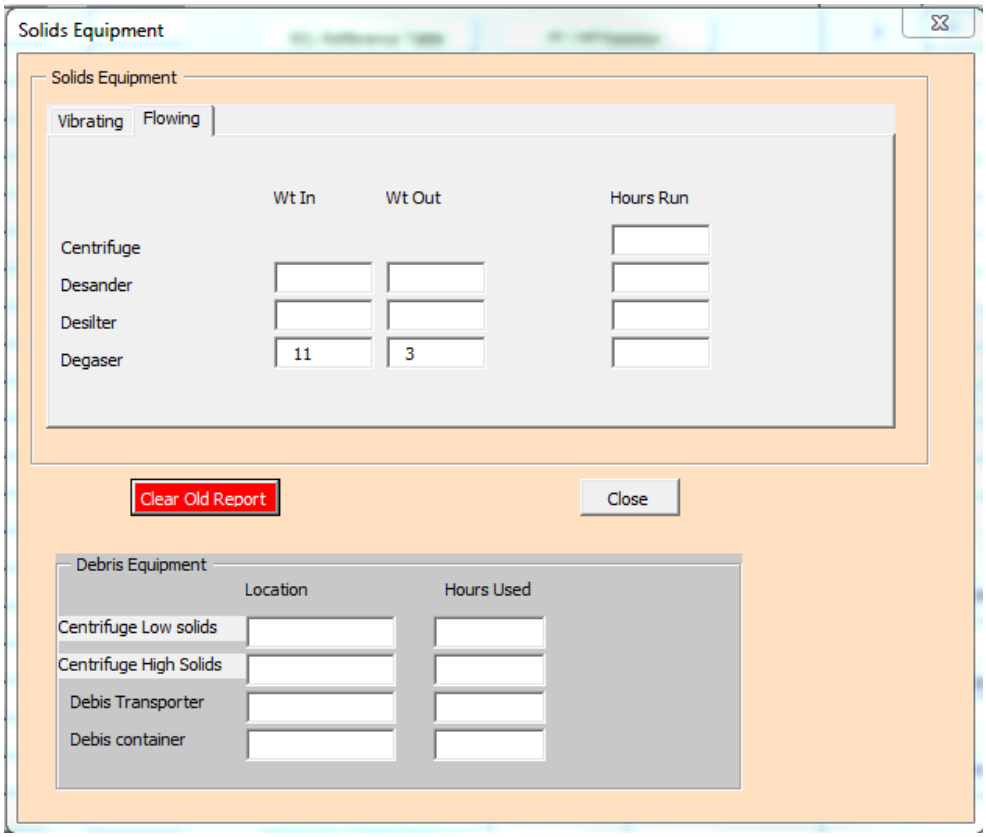
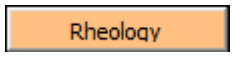


Figure 30 Solids Equipment (Flowing)

Selecting Clear Old Report deletes the existing data. New data relating to the flowing solids can now be entered.

Selecting Close saves the data and returns the program to the Full Mud Check dialog box.

d. Rheology

Selecting 

shows the Rheology Input dialog box (Ref. Figure 31).

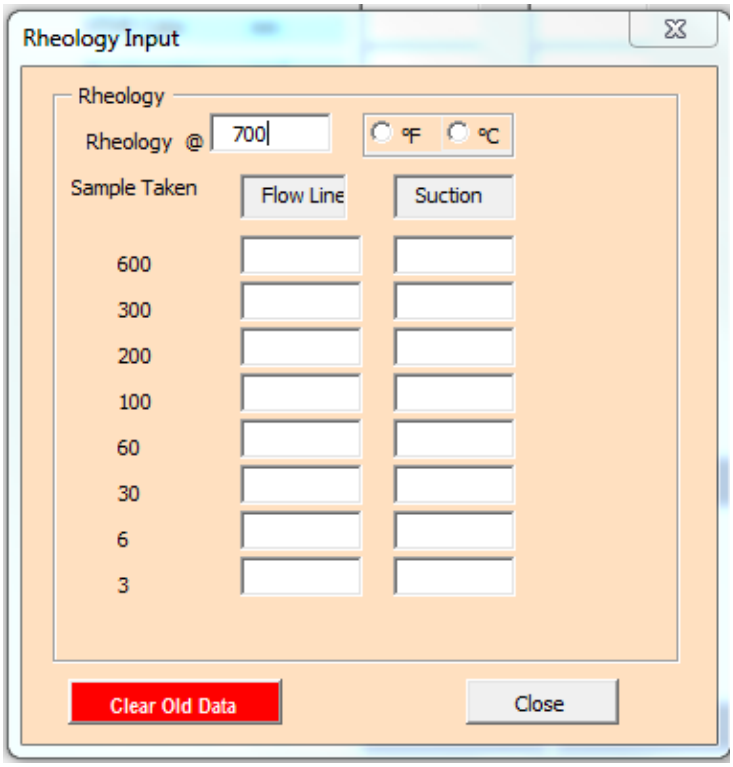
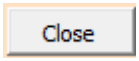


Figure 31 Rheology Input

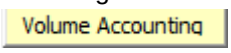
Selecting 

deletes the existing data. New data relating to the rheology can now be entered.

Selecting 

saves the data and returns the program to the Full Mud Check dialog box.

e. Volume Accounting

Selecting 

shows the Volume Accounting dialog box (Ref. Figure 32).

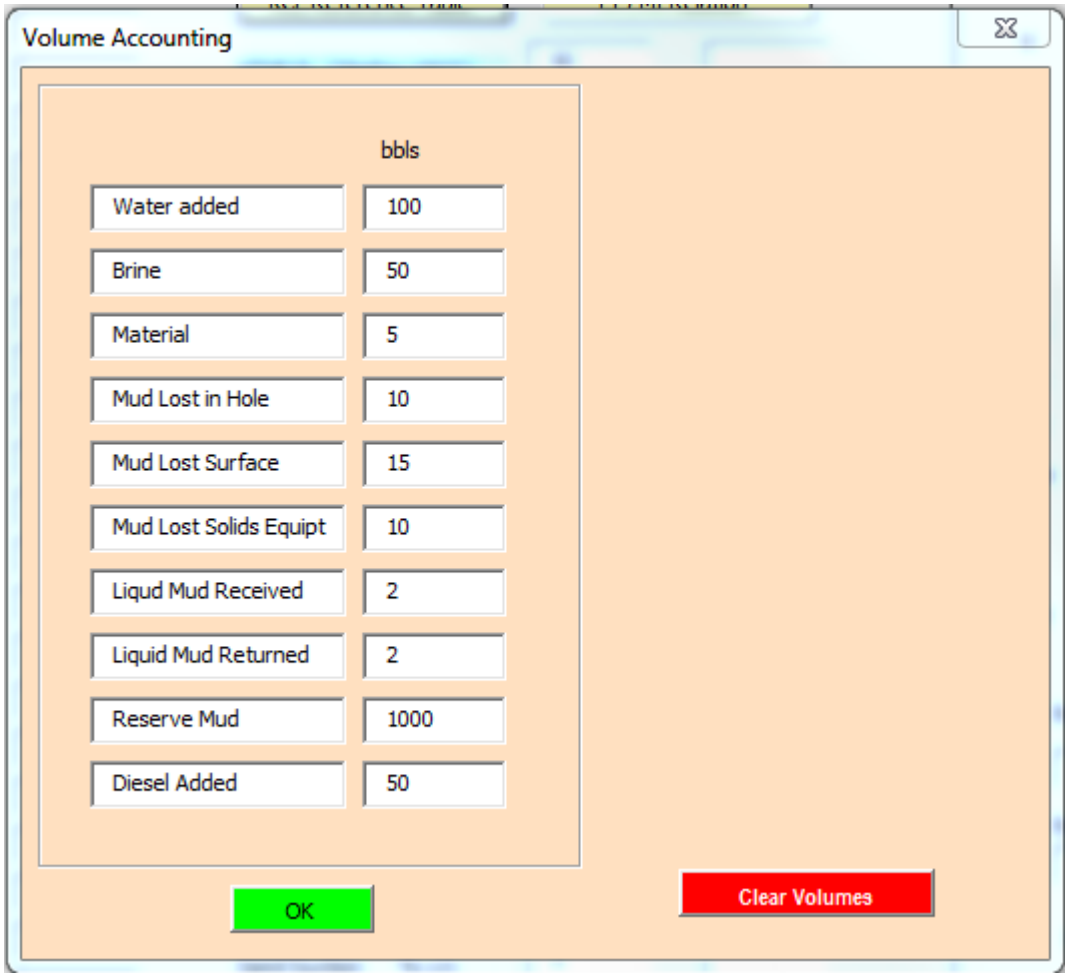
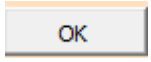


Figure 32 Volume Accounting

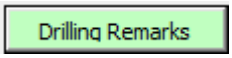
Selecting 

deletes the existing data. New data relating to the volume accounting can now be entered.

Selecting 

saves the data and returns the program to the Full Mud Check dialog box.

f. Drilling Remarks

Selecting 

shows the Add Remarks to the API Report Form (Drilling) dialog box (Ref. Figure 33).

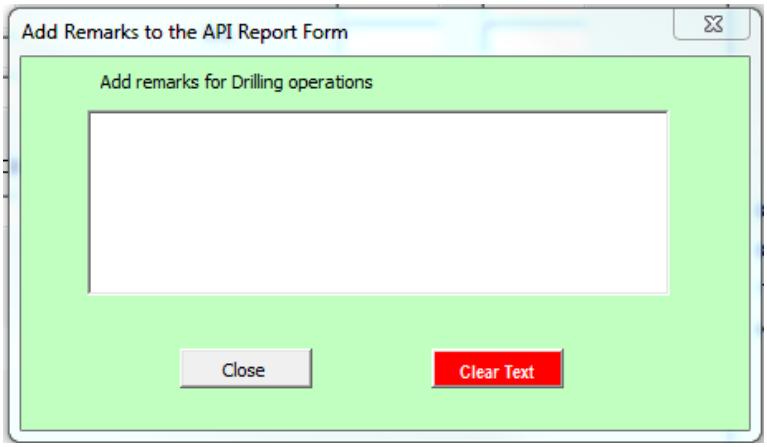
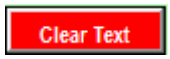
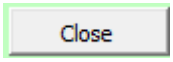


Figure 33 Drilling Remarks

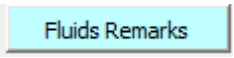
Selecting 

deletes the existing text. New text can now be entered.

Selecting 

saves the text and returns the program to the Full Mud Check dialog box.

g. Fluids Remarks

Selecting 

shows the Add Remarks to the API Report Form (Fluids) dialog box (Ref. Figure 34).

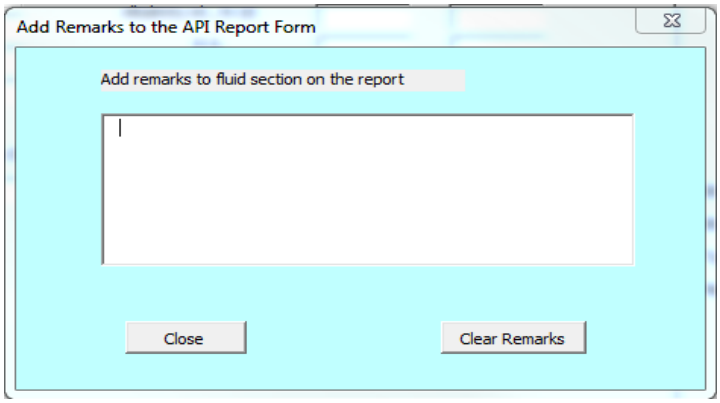
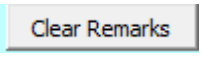
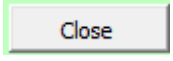


Figure 34 Fluids Remarks

Selecting 

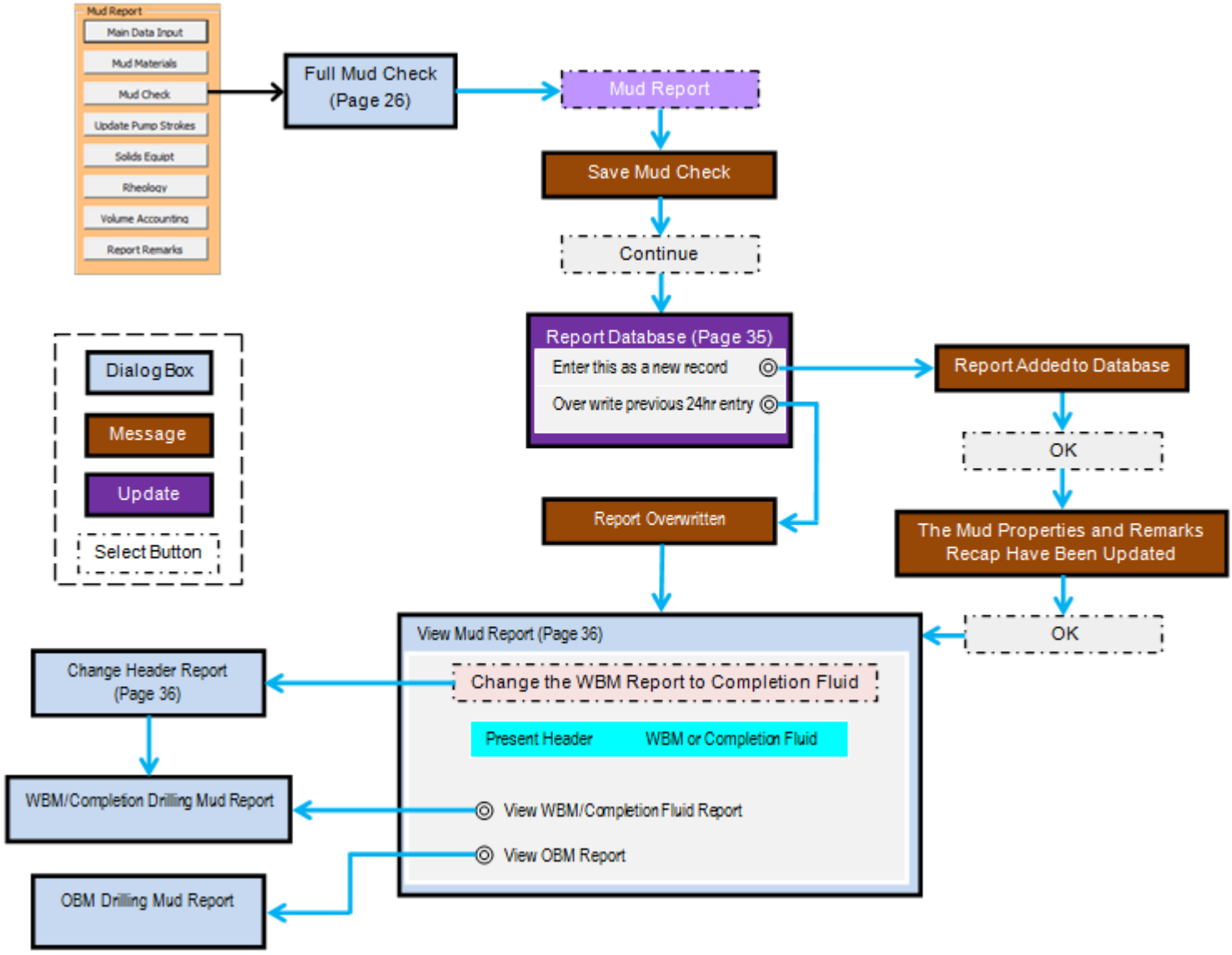
deletes the existing text. New text can now be entered.

Selecting 

saves the text and returns the program to the Full Mud Check dialog box.

h. Mud Report

The mud report saves all the Mud Check data and displays the selected mud report (WBM/Completion Fluid or OBM). Flow Chart F (Full Mud Check - Mud Report) is to help the mud engineer navigate this section of the program.



Flow Chart E: Full Mud Check - Mud Report

In the Full Mud Check dialog box (Ref. Figure 25), selecting Mud Report shows the Save Mud Check message box (Ref. Figure 35).

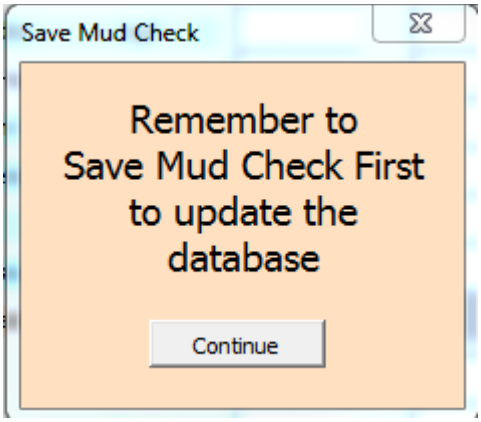


Figure 35 Save Mud Check

Selecting Continue shows the Report Database update box (Ref. Figure 36).

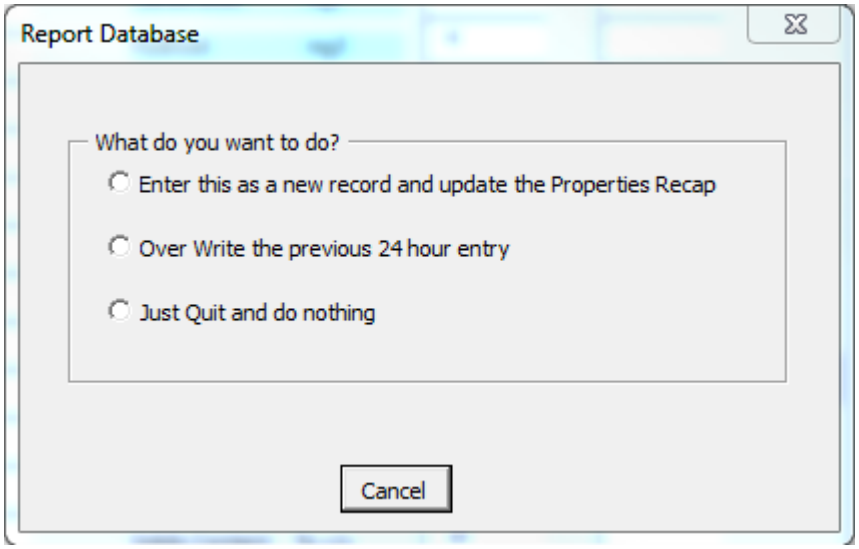


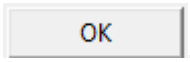
Figure 36 Report Database Update

Selecting Enter this as a new record and update the Properties Recap updates the mud report data base. A message is shown indicating that the mud report data base has been updated.

Selecting OK, in this message box, updates the mud properties recap and remarks recap. A message is shown indicating that the mud properties recap and remarks recap have been updated.

Selecting OK, in this message box, shows the View Mud Report dialog box (Ref. Figure 37).

Selecting Over Write the previous 24 hour entry, in the Reports Database dialog box, overwrites and updates the previous 24 hour entry. A message box is shown indicating that the mud report data base has been updated.

Selecting 

, in this message box ,shows the View Mud Report dialog box (Ref. Figure 37).

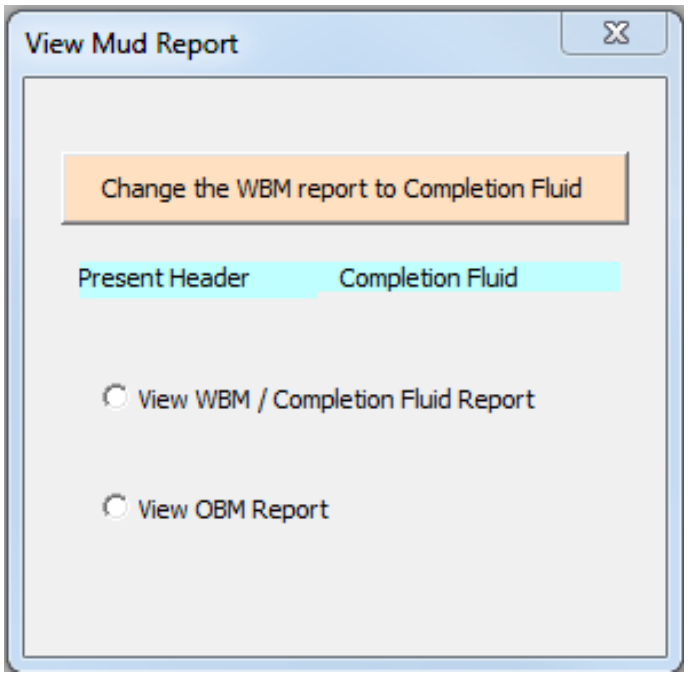
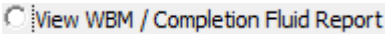
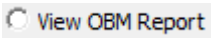


Figure 37 View Mud Report

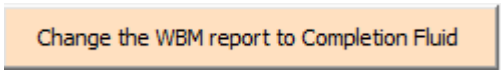
A message is shown indicating which of the reports is presently selected (WBM or Completion Fluid).

Select 

to view the currently selected WBM/Completion Fluid report.

Select 

to view the OBM report

Select 

to change the report header from the currently selected header to the alternative header (WBM or Completion Fluid). The Change Report Header WBM-Completion Fluid dialog box is shown (Ref. Figure 38).

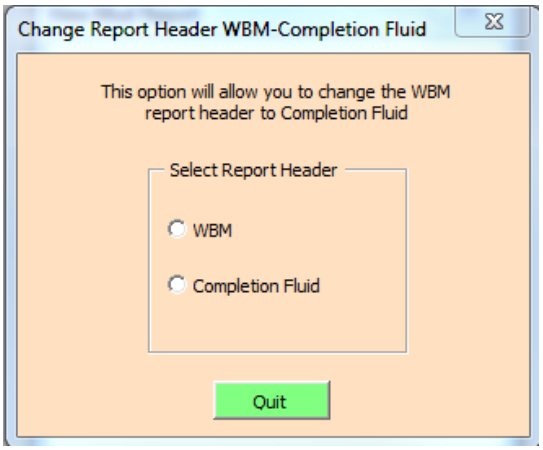


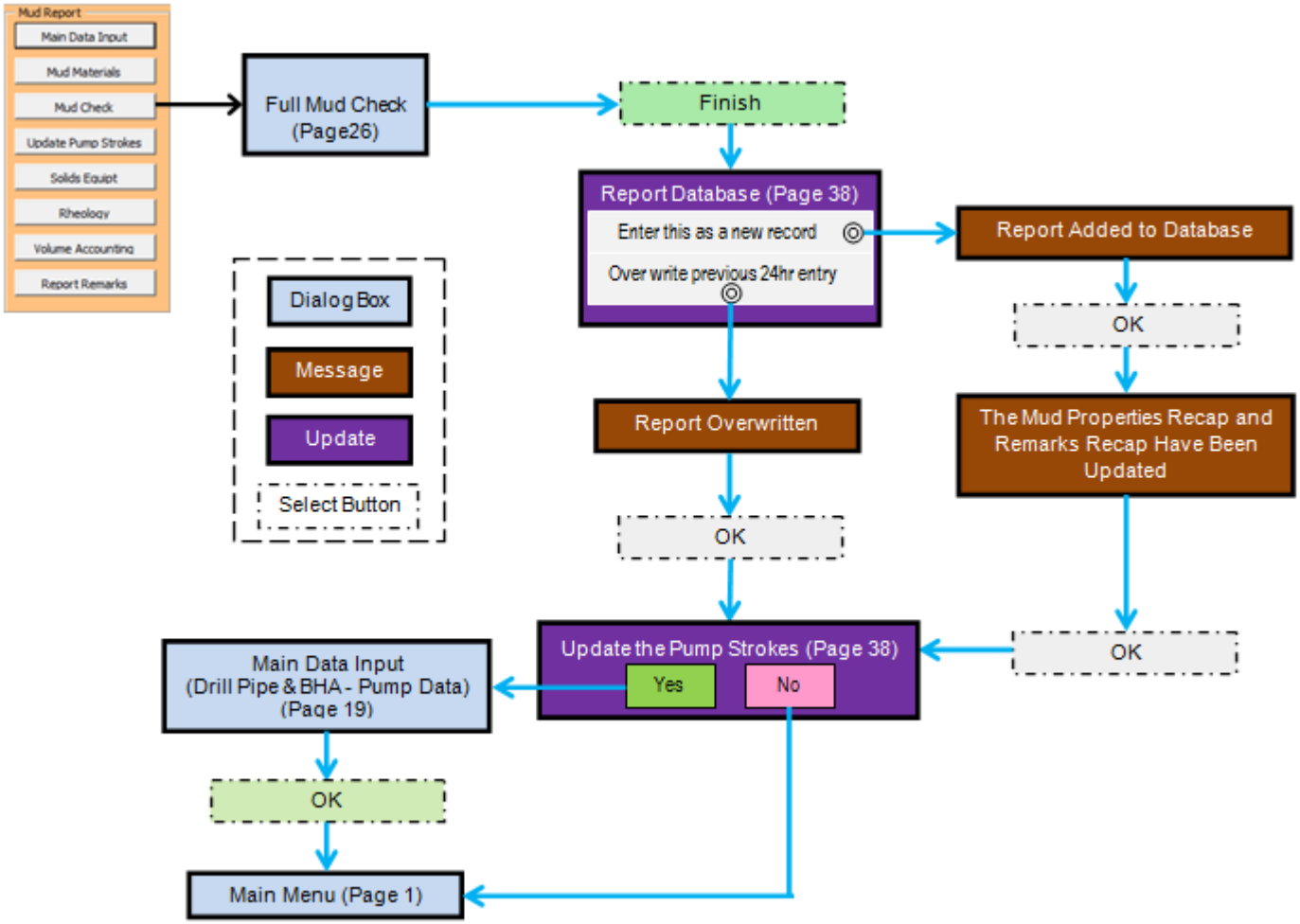
Figure 38 Change Report Header

Select the preferred report header (WBM or Completion Fluid). The selected report is shown.

To return to the Main Menu (Ref. Figure 1) select the Menu tab on the displayed report.

i. Finish

The finish function saves all the previously entered Mud Check data to the appropriate databases, reports and charts. Flow Chart F (Full Mud Check - Finish) is to help the mud engineer navigate this section of the program.



Flow Chart F: Full Mud Check – Finish

Selecting Finish on the Full Mud Check dialog box (Ref. Figures 15 &16) shows the Report Data Base update box (Ref. Figure 39).

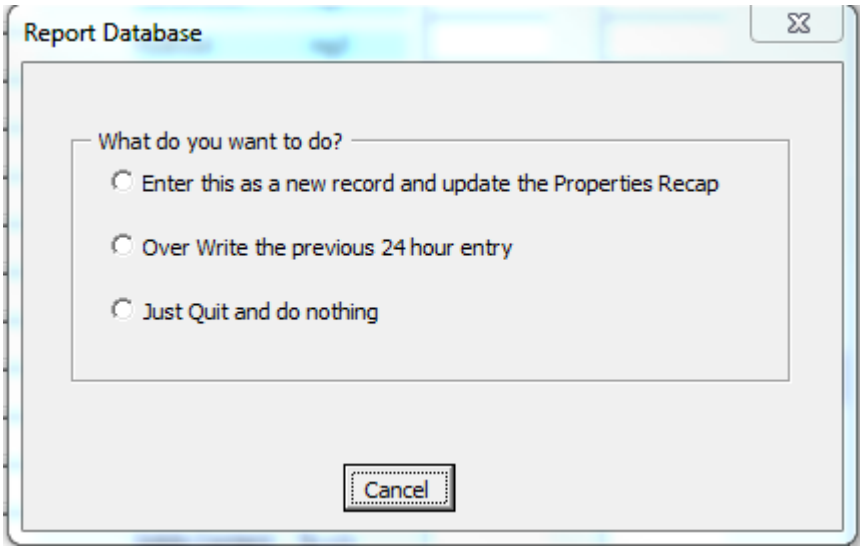


Figure 39 Reports Database Update

Selecting Enter this as a new record and update the Properties Recap, in the Report Database update box, updates the mud report data base. A message is shown indicating that the mud report data base has been updated.

Selecting OK, in this message box, updates the mud properties recap and remarks recap. A message is shown indicating that the mud properties recap and remarks recap have been updated.

Selecting OK, in this message box, shows the Update the Pump Strokes update box (Ref. Figure 40).

Selecting Over Write the previous 24 hour entry, in the reports Database dialog box, overwrites and updates the previous 24 hour entry. A message is shown indicating that the mud report data base has been updated.

Selecting OK, in this message box, shows the Update the Pump Strokes update box (Ref. Figure 40).

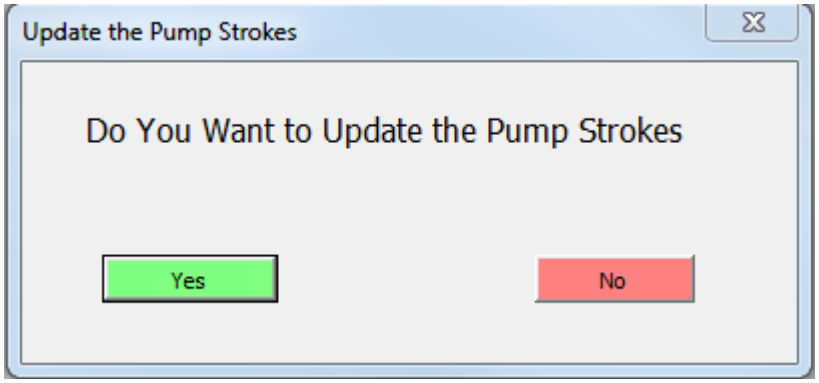


Figure 40 Update the Pump Strokes

Selecting No returns the program to the Main Menu (Ref. Figure 1).

Selecting Yes shows the Data Input (Drill Pipe & BHA - Pump Data) dialog box (Ref. Figure 18). The pump strokes are updated in the Pump Data section of the Data Input dialog box.

Selecting OK, in the Data Input dialog box, returns the program to the Main Menu (Ref. Figure 1).

(c) Mud Solids

Selecting Mud Solids on the Mud Reports and Databases Menu (Ref. Figure 5) shows all the water mud solids and all the oil mud solids/chlorides (Ref Figure 41 and Figure 41A).

WATER MUD SOLIDS

	Flow Line	CORR.	Suction	CORR
Mud weight ppg	8.60	8.60	0.00	0.00
Retort % Solids	10.00	9.69	0.00	100.00
Retort % Water	85.00	85.31	0.00	0.00
Retort % Oil	5.00	5.00	0.00	0.00
MBT equiv lb/bbl	16.00	16.00	0.00	0.00
ml of AgNO3, .0282/.282	6.00	6.00	0.00	0.00
S.G. of Oil	0.80	0.80	0.80	0.80
Low gravity solids %	17.16	16.55	257.58	257.58
Low gravity solids lb/bbl	156.12	150.64	2343.94	2343.94
High gravity solids %	-7.16	-6.86	-257.58	-157.58
High gravity solids lb/bbl	-106.63	-102.21	-3837.88	-2347.88
Bentonite %	-0.14	-0.07	-32.20	-32.20
Bentonite lb/bbl	-1.32	-0.63	-292.99	-292.99
Drilled Solids %	17.30	16.62	289.77	289.77
Drilled Solids lb/bbl	157.44	151.27	2636.93	2636.93
A.S.G.	1.46	1.43	-4.25	0.00
Corrected % Solids	9.69	9.69	100.00	100.00

KCL Polymer Mud		Flow Line	Suction	Weighted	No
KCL	% v/v	0.0	0.0		
Potassium Ion	mg/l	6	0		
Corrected LGS	% v/v	16.55	257.58		
Density	S.G	1.03	0.00		
Density	Kg/M³	1030.51	0.00		
Pressure Gradient	psi/ft	0.45	0.00		

Change Units of Measure

Figure 41 Water Mud Solids

OIL MUD SOLIDS/CHLORIDES				
	IN	CORR	OUT	CORR
Mud weight ppg	8.60	8.60	0.00	0.00
Retort % Solids	10.00	10.00	0.00	0.00
Retort % Water	85.00	85.00	0.00	100.00
Retort % Oil	5.00	5.00	0.00	0.00
MBT equiv lb/bbl	0.00	N-10	0.00	N-10
ml of AgNO3, .0282/.282	0.00	0.00	0.00	0.00
S.G. of Oil	0.80	0.80	0.80	0.80
Low gravity solids %	23.39	29.57	181.82	198.01
Low gravity solids lb/bbl	212.89	269.12	1654.55	1801.85
High gravity solids %	-13.39	-19.57	-181.82	-198.01
High gravity solids lb/bbl	-199.58	-287.74	-2709.09	-2910.68
Bentonite %	-0.14	-0.07	-32.20	-32.20
Bentonite lb/bbl	-1.32	-0.63	-292.99	-292.99
Drilled Solids %	22.39	28.57	180.82	197.01
Drilled Solids lb/bbl	203.79	260.02	1645.45	1792.75
A.S.G.	0.39	-0.63	#DIV/0!	#DIV/0!
Corrected % Solids	10.00	10.00	0.00	0.00
Sodium Cholride IN	0.00	0.00	#DIV/0!	0.00
EXCESS LIME lb/bbl	0.00	0.00	0.00	0.00
OIL RATIO	5.56	0.00	#DIV/0!	0.00
WATER RATIO	94.44	0.00	#DIV/0!	0.00
CaCl2 % lb/bbl	0.00	0.00	0.00	0.00
Cacl2 %by Wt	0.00	0.00	#DIV/0!	0.00
CL-om, mg/L	0.00	0.00	0.00	0.00
CL-,mg/L(of water)	0.00	0.00	#DIV/0!	0.00
Ca -om	0.00	0.00	#DIV/0!	0.00
CaCl2mg/l(H20)	0.00	0.00	#DIV/0!	0.00
Cacl2 , ppm, (H2O)	0.00	0.00	#DIV/0!	0.00
Brine Density	1.00	0.00	1.00	0.00
CaCl2 (OM) , mg/L	0.00	0.00	0.00	0.00

Figure 41A Oil Mud Solids/Chlorides

Selecting [Change Units of Measure] shows a message box indicating that changing the units will be universal throughout the program.

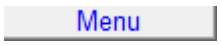
Selecting [OK] ,in this message box, shows the Select Units dialog box (Ref. Figure 4). The units of measurement are changed in this dialog box.

Selecting [Continue] returns the program to the Main Menu

(d) Databases

In the Databases panel, on the Mud Reports and Databases Menu (Ref. Figure 5), the various databases can be quickly viewed. The databases are:

- Mud Stocks Database
- Mud Report Database
- Mud Received Database
- Mud Transferred Database.

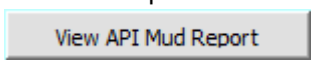
Selecting 

on any of the databases returns the program to the Main Menu.

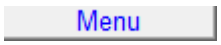
(e) View Reports

In the Select Report to View panel, on the Mud Reports and Databases Menu (Ref. Figure 5), The various reports can be quickly viewed. These reports are:

- View API Mud Report
- View Mud Properties Recap
- View Mud Materials Recap
- View Remarks Recap.

Selecting 

shows the View Mud Report dialog box (Ref. Figure 37).

Selecting 

on any of the reports returns the program to the Main Menu.

(f) Pills and Calculations

Selecting Calculations from the Main Menu (Ref. Figure 1) shows the Pills and Calculations dialog page (Ref. Figure 42).

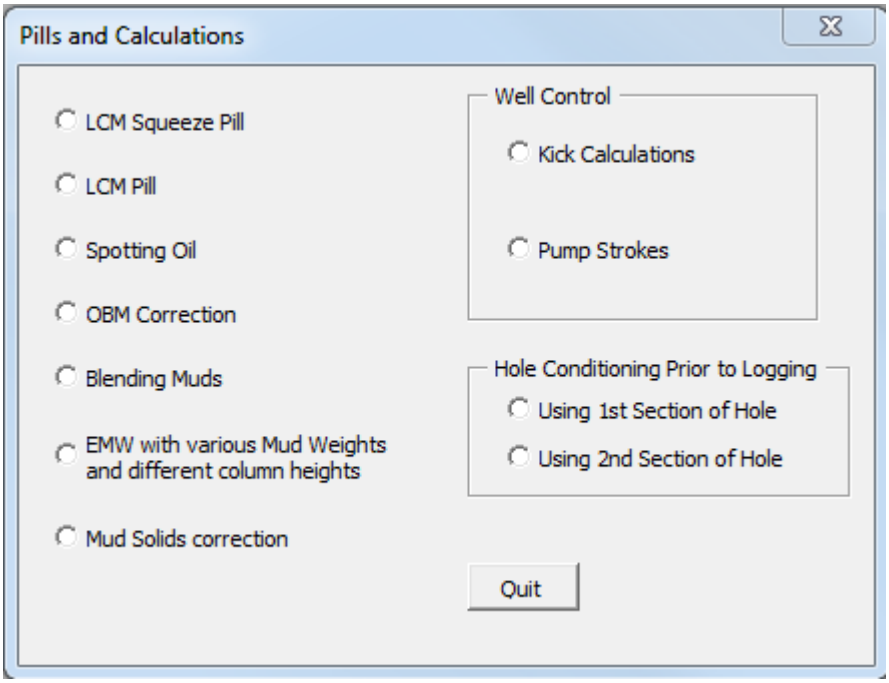


Figure 42 Pills and Calculations

From this dialog box, the following are accessed:

- LCM Water Squeeze Pill dialog box
- LCM Pills dialog box
- Spotting Oils dialog box
- OBM Corrections dialog box
- Blending
- Blending and Weighing-up Mud dialog box
- The EMW with different mud columns calculation dialog box
- Mud Solids Correction:
    - Water Mud Solids dialog box
    - Oil Mud Solids/Chlorides dialog box
- Well Control
    - Well Control (Kick) Program dialog box
    - Pump Strokes Calculations dialog box
- Hole Conditioning Prior to Logging
    - Using 1st Section of Hole dialog box
    - Using 2nd Section of Hole dialog box.

The relevant data is entered into the appropriate data boxes. All calculations are done automatically.

(g) Reports

1. Print Reports

Selecting Print Reports on the Main Menu (Ref Figure 1) shows the Print Central dialog box (Ref. Figure 43). The selected report is automatically printed.

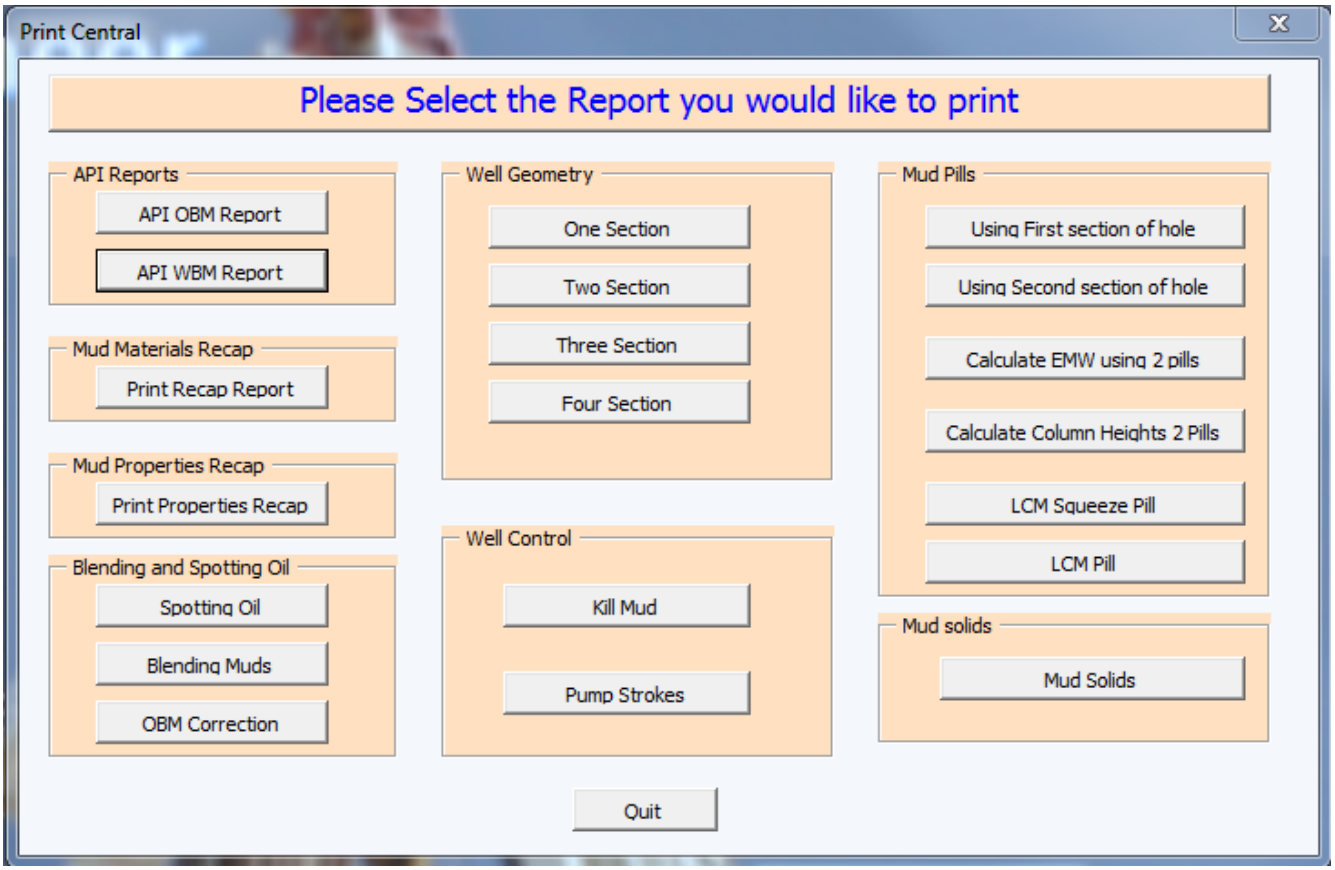


Figure 43 Print Central

2. Export Reports

Selecting Export Reports on the Main Menu (Ref Figure 1) shows the Export Reports dialog box (Ref. Figure 44).

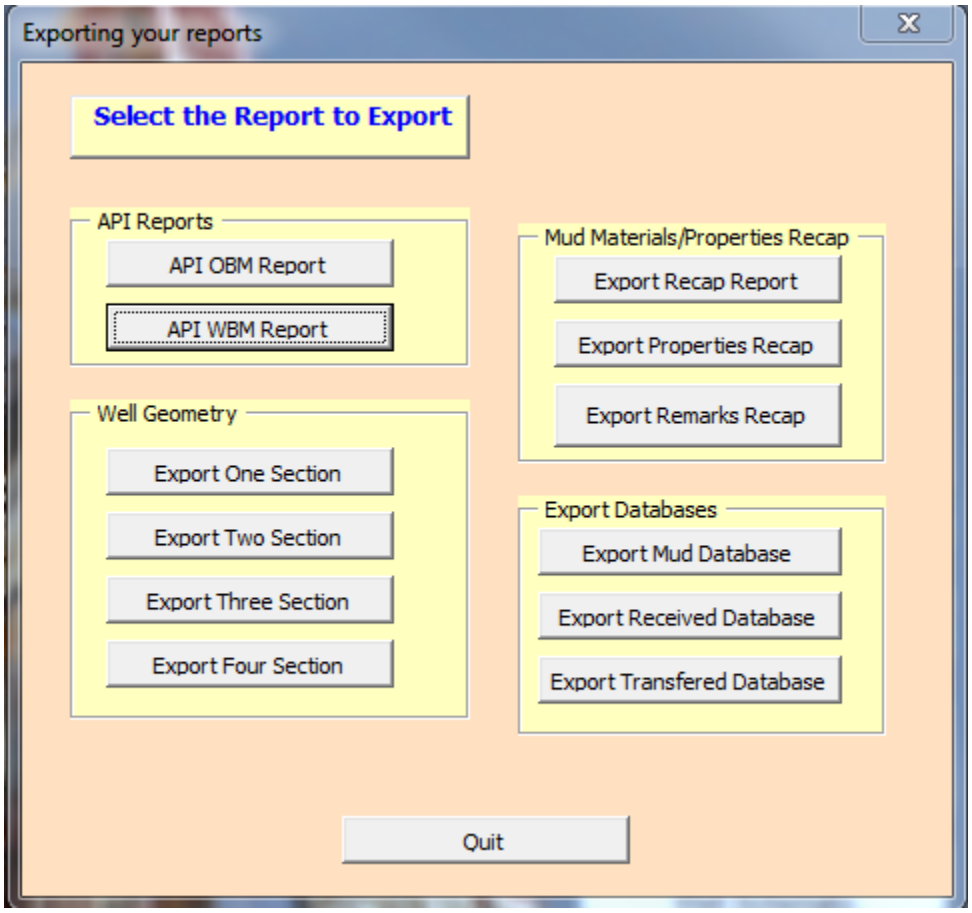


Figure 44 Export Reports

When selecting a report for export, a message box is shown indicating that the report will be exported to a selected folder.

Selecting OK, in this message box, gives the option of which folder to export the file to. After saving the file a message box indicating the file has been saved is shown.

Selecting OK, in this message box, returns the program to the Main Menu.

3. Email Reports

Selecting [Email Reports] on the Main Menu (Ref Figure 1) shows the Email Reports dialog box (Ref. Figure 45).

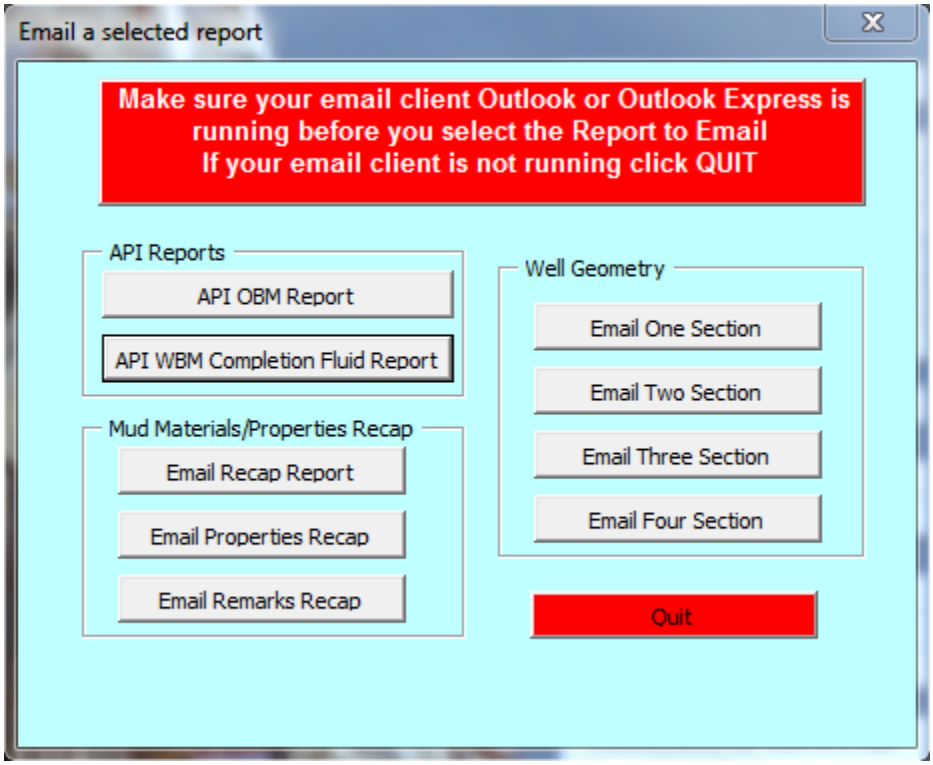


Figure 45 Email Reports

The Email Reports dialog box shows a warning to select an Email program

After selecting a report for Emailing, a message box is shown indicating that the report will be exported to a selected folder.

Selecting [OK], in this message box, gives the option of which folder to export the file to. After saving the file a message box indicating the file has been saved is shown.

Selecting [OK], in this message box, opens the selected Email program. The selected report is automatically attached to the Email. The recipients Email address must be is inserted before sending the report.

(h) Well Schematics

Selecting Well Schematic on the Main Menu (Ref. Figure 1) shows the Well Bore Schematic dialog box (Ref. Figure 46).

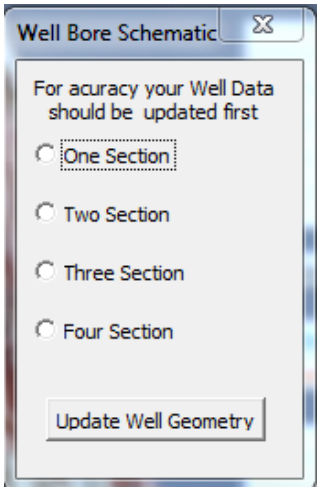


Figure 46 Well Bore Schematic

Up to four casing sections can be selected. Figure 47 these casing sections

To update the well geometry, select Update Well Geometry on the Well Bore Schematic dialog box. The Main Data Input (Drill Pipe & BHA – Pump Data) dialog box is shown (Ref. Figure 18).

The DP and the DC parameters are entered/edited in this dialog box.

Selecting the Casing Data tab on the Data Input (Drill Pipe & BHA – Pump Data) dialog box shows the Main Data Input (Casing Data) dialog box (Ref Figure 23). The liner parameters are entered or edited in this dialog box.

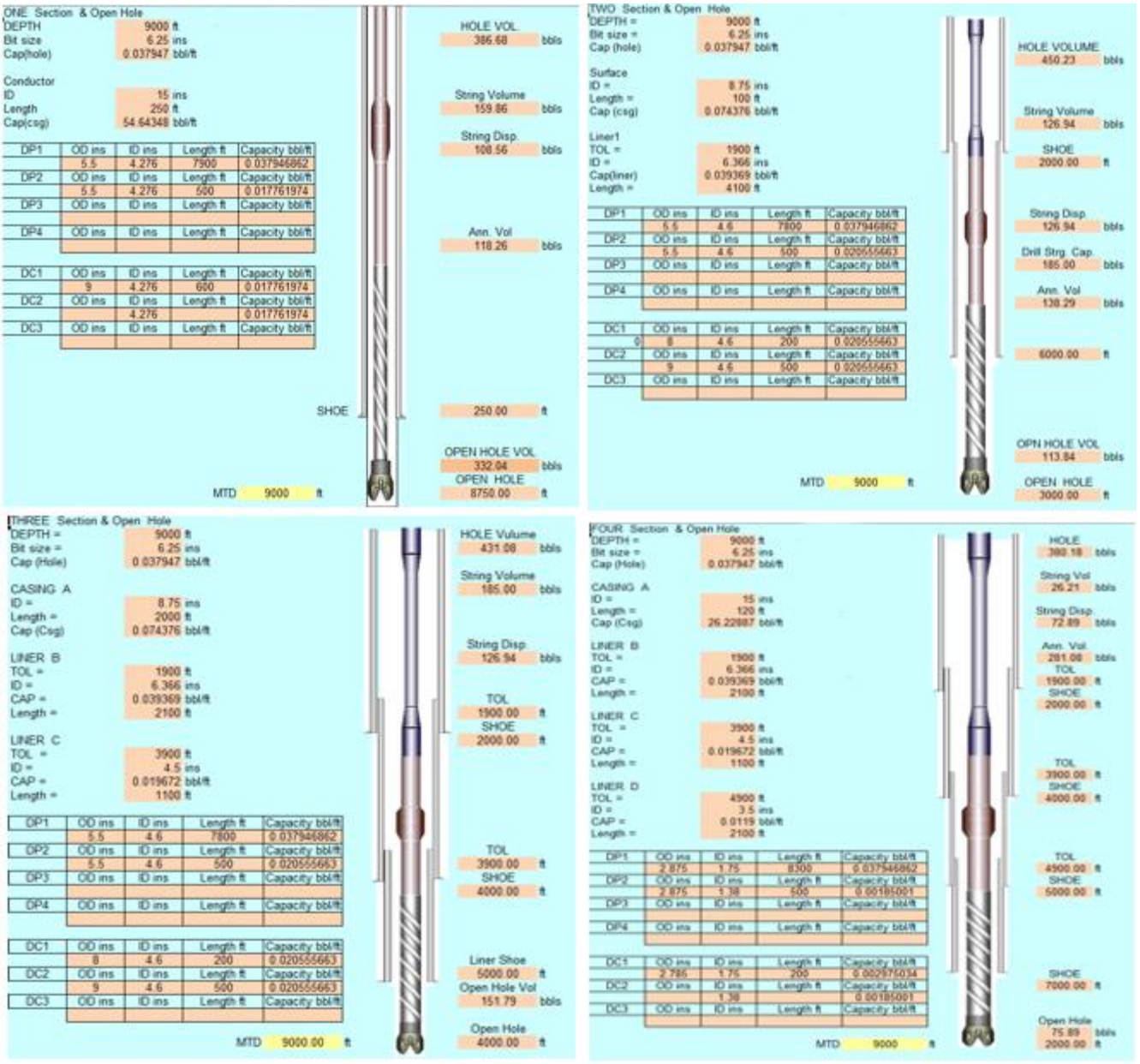


Figure 47 Well Schematic Sections

(i) Charts

Selecting [Charts] on the Main Menu shows a message box, indicating that the charts will be developed as the databases are updated. Figure 47 shows the Chemicals Used chart

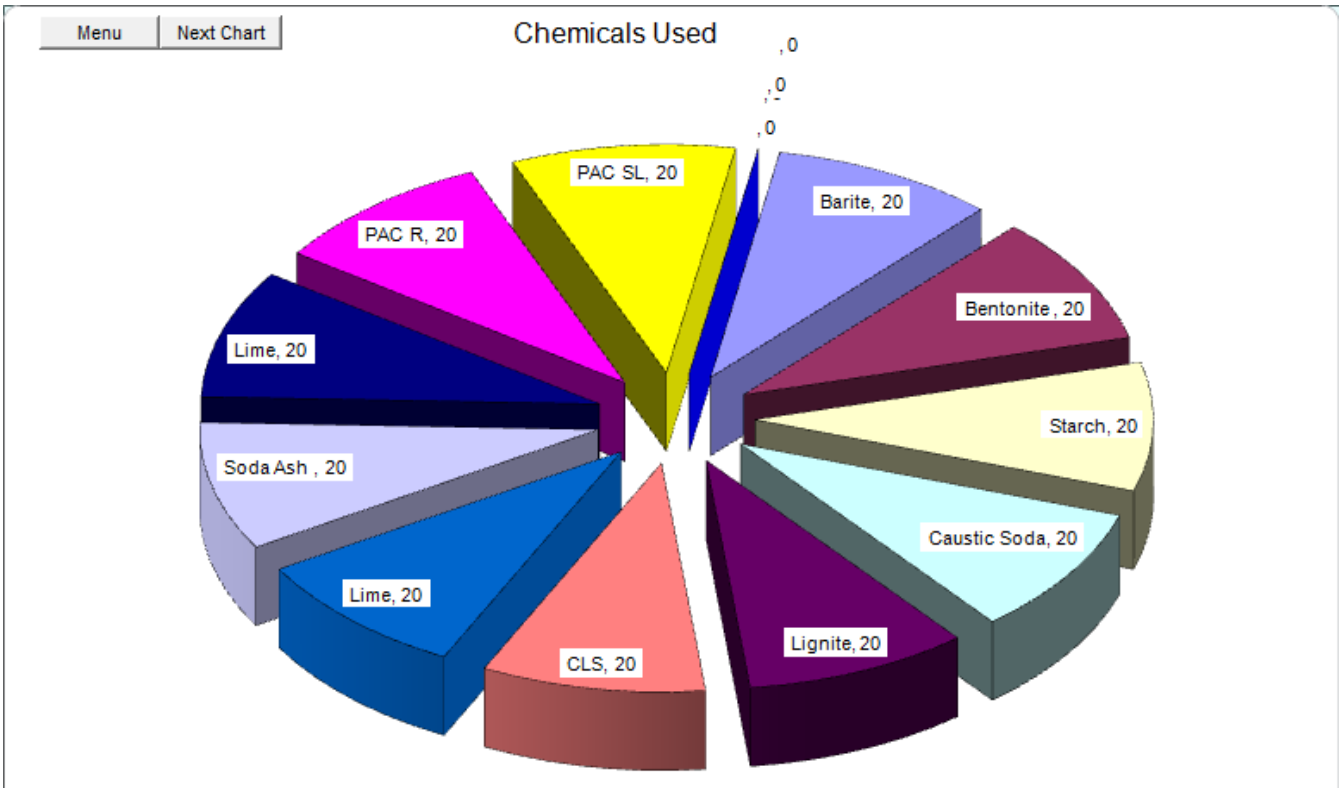


Figure 5 Chemicals Used Chart

Selecting [Next Chart] shows these charts in sequence:

- Chemicals Used and Cost
- Depth v Mud Cost
- Total Volumes
- Depth v Days
- Depth v Mud Weight

Selecting [Menu] returns the program to the Main Menu.