

Revised 12-17-25

## MainLog Manual

MainLog is an interactive program in both “Drilling” and “Office” modes. Purchasing a yearly license fee enables data acquisition, entry and editing capabilities. The Office version is not just a viewer, as many features that are in the drilling program are also available in the Office program. The manual covers both modes.

From the Index and in the body of the manual, any item with an asterisk (\*) next to it, signifies that the feature is available in “Office Mode” as well as “Drilling Mode”.

\*\*\*Each index item in has a link, just pan and click on the menu or feature you want to go to.

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## FAQs

**Q:** How do I rename my file without having to do it manually in explorer?

**A:** Click on **File** and select **Change File Name**. In the pop-up dialog change the name in the File name edit box to what you want it to be. Click the **SAVE** button and MainLog dialog will open the new file name. All auxiliary files (hdr, rpt, lag, etc.) will be copied to the new name except backup files. Not that the original filename will still be in the Mainlog folder and can manually be deleted.

**Q:** How do I know what my com ports are?

**A:** After plugging the adapters in, to find out what com port the adapters are on, go to **“Control Panel”** then **“System”**, then **“Device Manager”**. You will see the device, **“Ports”** with a **“+”** sign or **“>”** next to it. Click on either sign and you will see what com ports the adapter(s) are on.

**Q:** How do you import a gamma ray?

**A:** To import any e-log curve the data must be in a certified LAS file format. Click on **Import\Import E-log Data**. Choose the directory or drive the LAS file is in and click **“Open”**. From the dialog pop-up box, you will see an **“Import Source File”** which shows the interval and KB of the data on the right side and the **“Destination File”** on the left side. MainLog defaults the destination name to the name of the mudlog file, but you may change it to a name that reflects where the e-log data is from. (i.e. it may be that it is a gamma from an offset well and you give it that name.)

From **“Available Curves”** highlight the curve you want and on the left side select from **“Import as”** the curve you chose. Do this for each curve and then click **Import**. **Note:** MainLog gives the imported curves a filename with a **“MLC”** file extension and by going to **Import/Select**; you can choose what **“MLC”** file you want superimposed on the mudlog.

Once the curves are imported, click on **Schemes/Edit**. Schemes allow you to turn on or off any data type contained in the log file, or the E-LOG curve file. Checking the data type in the schemes dialog will turn it on if that data type is available. Once set, you can name the **“data set”** and these lines will be displayed when the

named scheme is selected from the scheme menu. If the gamma ray was the only curve you imported, from **Schemes/Edit**, check the box **“Gamma”** under the **“Mudlog”** scheme and click **“Save”**. The gamma ray should now be on your mudlog.

**Q: How do you get rid of an imported gamma ray?**

**A:** If you just want to take it off the log just uncheck it in the Schemes\Edit dialogue. If you have imported the wrong Gamma Curve you can re-import the correct one and from the Import Dialog, check the box, **“Replace Current Gamma File”** before checking Import. Another option to get rid of it is to go into **“Windows Explorer”** and on **“C” drive** find the **“mainlog”** folder and delete the **“filename.mlc”** file.

## **MainLog in Drilling Mode**

The **Field Program** is used for data acquisition and has additional features for entering data, tracking real time ROP, Gases and other features. The following instructions will vary according to which features are enabled in the program you are using. To be in drilling mode, you must have a “hardware key” that’s license is up to date.

MainLog should run at any screen resolution currently available. If you have problems related to screen resolution, (or any other issue) please let us know and we will do our best to resolve the issue. Most programming is done at **1280 X 1024**, but the log should look good at any higher resolutions.

We can be contacted at 207-671-0154, 432-934-1772 or E-mail [admin@mainlog.com](mailto:admin@mainlog.com).

### **\* Hardware Requirements & PC Settings**

- Any Windows Laptop or Desktop PC
- **We strongly recommend not using laptops with Intel i3 processors as there have been issues getting a proper connection to com ports.**
- Serial to USB adapters (**recommended Triplite Keyspan adapters**, for WITS & Gas Interfaces)
- Recommend a minimum external four port USB Hub with its own power supply.
- MainLog will need USB ports for the following: WITS, Gas, Hardware Key, Depth.
- (Additional ports will be needed for Keyboard, Mouse, Printer, Cellular Modem).
- Monitor capable of 1024 X 800 or higher resolution recommended. **Monitors with vertical resolutions of less than 800 will not display some views of the mudlog appropriately.**

- Monitors capable of 1280 X 1024 or higher resolution recommended for horizontal logs.
- Satellite internet connection recommended and needed for e-mail & real time viewing and monitoring.
- **\*\*Interface for depth, strokes, off bottom and chromatograph trigger provided by MainLog.**
- **\*\*\* CLEAN dry closure contacts are required for the depth, strokes, off bottom and chromatograph.**

## **PC Settings**

When using a “PC” for running the field version of MainLog certain settings should be set to avoid potential problems. These settings may vary depending on whether you have a laptop or desktop, as well as the operating system being used. Items to check for on your computer include the following:

### **Power Options**

### **Folder Options**

### **Screen Savers**

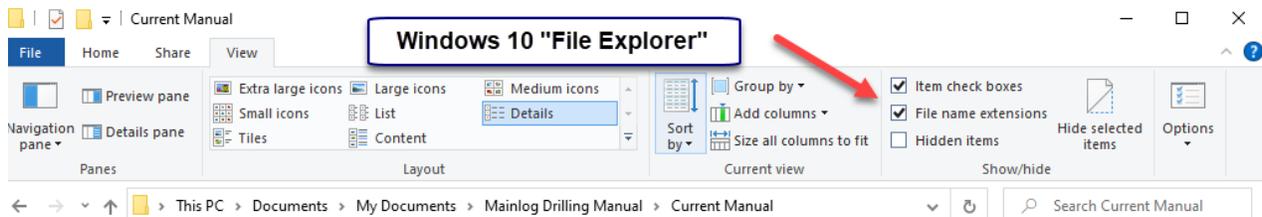
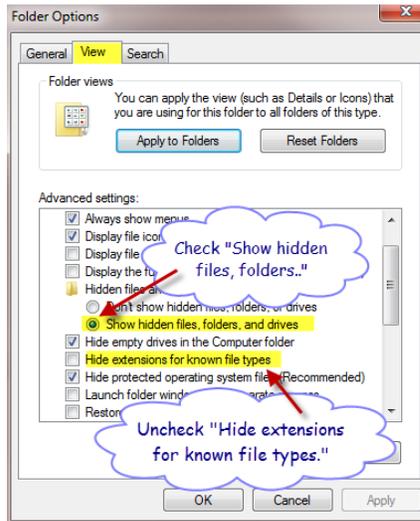
## **Power Options**

On the Windows Operating System find the **Power\Display Settings (Options)** and set **Power, Sleep and Screen** settings to **“NEVER” turn off.**

## **Folder Options**

Items in **“Folder Options”** should also be changed. This can be accessed can be accessed through **“Control Panel”** by clicking on **“Folder Options”**.

On the **“View”** tab **check** *“Show hidden files, folders and drives”* and **uncheck** *“Hide extensions for known file types”*. Click **“Apply”** the **“OK”**.



## Screen Savers

- Turn off “Screen Savers”. In **Windows 7**, right click on the desktop and click on “Personalize”. Turn off “Screen Saver”.

## Windows Updates

- **Turn off Automatic Windows Updates.** Check for updates and install updates between wells or during downtimes. (trips)

## Installation of MainLog for “Field” Use

If you do not have a CD, the field version of MainLog can be downloaded from our website at, [www.mainlog.com](http://www.mainlog.com). Also, from the website download the **“Sentinal Drivers and install them before inserting the “Drilling Key” into the computer.** (Sentinal Drivers are only needed on new installs and not on upgrades)

(<http://www.mainlog.com/download.htm>)



**MainLog should be installed first and then the Sentinel Drivers.** When opening the install executable programs, InstallShield Wizard will begin, just accept all defaults.



MainLog’s field program is installed on the computer’s “C” drive, <c:/mainlog>. After installation of the Sentinel Drivers, insert the “Drilling Key” and then open Mainlog from the icon on your desktop. MainLog will open with the “elogdemo.mlw” file. Now, click on **File\New**, to begin your new well and put you in drilling mode. If you are not in drilling mode or you are having other issues with the installation, please call us. (Dave - 207-671-0154) or (John - 432-934-1772). Please go to: **New (starting a new well (file))**.

\*\*\*Also, once the program is installed, Triplite Keyspan USB to serial adapter drivers must be installed to get a WITS feed and\or read instruments. See below: [\*\*Com Ports for WITS and Gas Equipment\*\*](#)

## [Installation of MainLog for Office Use](#)

The Office version of MainLog can be downloaded from our website at, [www.mainlog.com](http://www.mainlog.com) .



After downloading, follow the on-screen instructions and MainLog will be installed. For users who do not have “**Administrator Rights**” on their PC, they will need to contact their IT department to install MainLog.

## [Upgrade of MainLog](#)

When doing an upgrade of MainLog, go to our website, [www.mainlog.com](http://www.mainlog.com) and download the latest field or office version and install. You can download the file with MainLog open, but you will need to close it while installing. When clicking on the executable, InstallShield Wizard will begin, just accept all defaults. For the Field version, **it is not** necessary to reinstall Sentinel Drivers if you already had a drilling key working on the computer.



Please note that with an upgrade you will not lose any of your log files. Also, if for any reason, you should uninstall MainLog, you will not lose any of your files unless you manually delete the mainlog directory from Windows Explorer.

## Com Ports for WITS and Gas Equipment

Whether reading data via WITS or from gas equipment, determine that they are on the proper com ports. MainLog recommends using a “**Triplite Keyspan**” **USB to Serial Adapter** with connections to EDR workstations, and gas instrumentation.

**\*\*\* Note: Before plugging in the Triplite Keyspan adapters, first install the Keyspan drivers.**

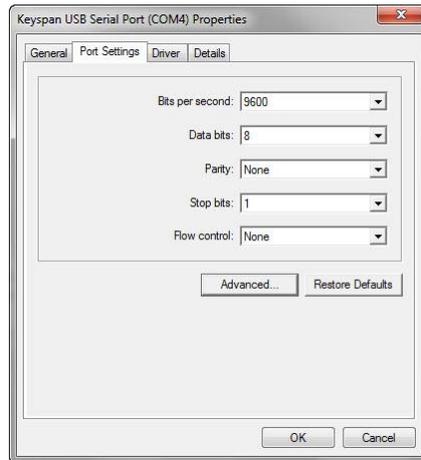
To find out what com ports they are on, after plugging them in to the computer; go to **Control Panel\System\ Device Manager**. Click on and expand, “**Ports (Com & LPT)**”. If you have two serial adapters plugged in, you should see something like this:



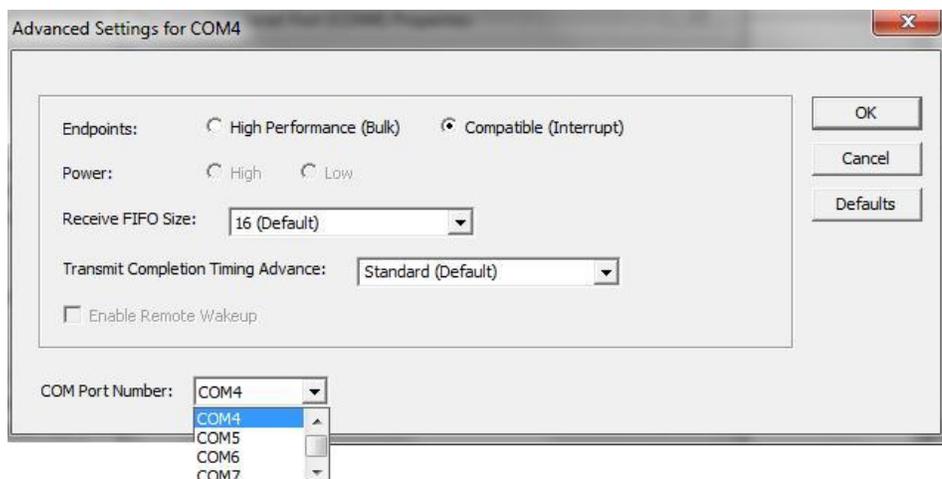
When using I-ball instruments (Bloodhound), the drivers installed are from Silicon Labs and will look this in Device Manager:



If the com **ports are higher than Com 9, they will not work with MainLog** and must be changed. To do this, go to Device Manager, **highlight**, and **right click** on the com port that needs to be changed and left click on **“Properties”**. Next click on the **“Port Setting”** tab and then on the **“Advanced”** button.



You should see a **“Com Port Number”** box where you can see and change to other com ports. Select one that is lower than Com 10. You may see com ports that says, “in use”, more than likely they are not, so you still may be able to select them to try and connect.



Once you know what com ports you have, you can now return to MainLog, go to **Setup\Gas Monitor Setup**, and put in the appropriate com ports. If the com port boxes are grayed out, you must exit Setup and go to **Options** and turn off your gas

and WITS monitor to change them. Also, verify the WITS mode is set correctly to **Pason Request Response or Time Based (2 sec)**.

If you have selected **Older Bloodhound Wits (115000) Instrument Type**, MainLog will automatically set the WITS mode to **“Other”**. If the Instrument Type is set to *Terra SLS*) MainLog will automatically set the WITS mode to **Other, Time Based (2 sec)**. If the Instrument Type is set to **Wits or New Bloodhound** and a New Bloodhound is being used, the logger must **manually set the WITS Mode to Other, Time Based (2 sec)**.

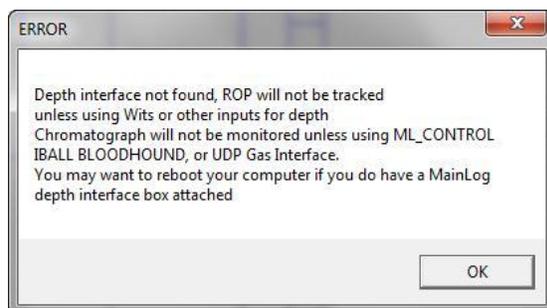
### **\*Starting the Program & Navigation**

MainLog can be opened in several ways. First by double clicking the icon on the desktop or going through the start menu. When opened this way, the file that was open when MainLog last closed will reopen. You can also create a shortcut to a specific “. mlw” file and double clicking this short cut will always open that file. This is handy if you have an offset that you are correlating to. You can open as many different files as your computer memory and screen size will allow, however, only one copy can be in drilling mode at a time, and you will be prompted if more than one copy of MainLog is running.

**“One or more copies of MainLog is running. Only the FIRST COPY OPENED will allow drilling to be enabled. Close all programs now running, then start MainLog again and drilling mode will be available.”**

You can also create a shortcut to any “mlw” file on the desktop. The target file will always open in office mode and will not interfere with your drilling file. Do not open 2 copies of the "LIVE" drilling file.

When the program opens in “drilling mode”, you will get the following error message if no depth interface is found:



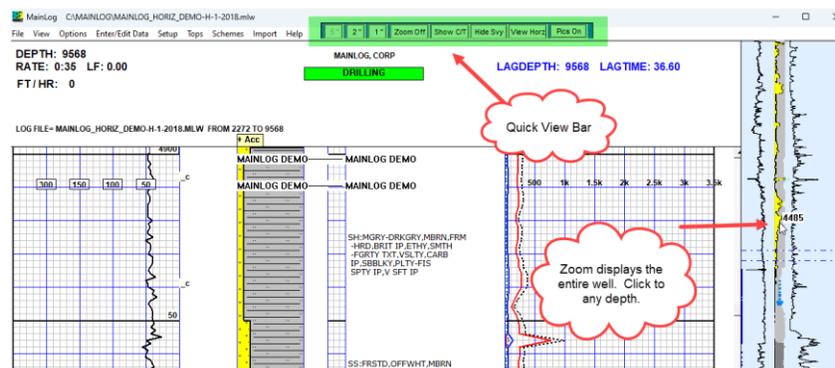
This is a reminder that depth will not be tracked if there is no depth interface.

There are many ways to navigate through the file.

- Left click anywhere on the log and then use the mouse wheel to scroll up or down.
- Using the scroll bars will move you up or down in the file 20 ft if clicking the arrows (2 ft if control key is held down), 100' when clicking above or below the arrows, (500 ft with the control key down).
- Dragging the thumb button on the scrollbar will display a depth in a small text box; the screen will be redrawn from the depth shown when you let the mouse button up.
- Page up, page down will move you up or down 100', 500' if the control key is held down.
- Left clicking above or below the grid (when possible) will move you up or down 100' in the file. Right clicking these areas will move you 500'.
- Using the “Zoom” feature shows the entire well on the right side of the screen. Click on any part of the well and it will take you there on the 5-inch log.

## Quick View Bar

The Quick View Bar at the top of the log is a quick way to go from a 5”, 2” or 1” log. It also is a fast way to turn on or off **Custom Tracks**, **Survey’s**, and the **Horizontal Log**. It also has a **Zoom Button** which shows the entire log. Click at any point to take you to that depth on the log. Custom Tracks must be off to use the Zoom button.



## Live updates using Dropbox (Real Time Updates)

**\*\*\*Before installing Dropbox please understand that it is the mudloggers and mudlogging companies' responsibility to remove the people viewing the Dropbox folder after every well, unless of course the next well it is for the same oil company and geologists.**

**Live updates are available for an additional charge.** If you are interested in this feature, please contact us.

First download and install the latest version of **Dropbox**, a free download from [www.dropbox.com](http://www.dropbox.com) is available.

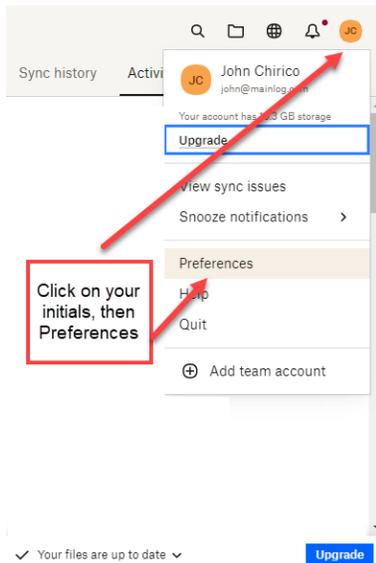
**Note:** You will need a **separate Dropbox E-Mail Account for each Field Computer**. It is recommended to assign a drilling key to each computer. Switching out keys is not a problem, **but you will have to re-share the Dropbox subfolders if you switch the drilling key.**

When installing just follow the directions from Dropbox which will place the program in the “c:\Program Files” directory. ***However, for Dropbox to work with MainLog, Dropbox will need to be in the MainLog directory so carefully follow the instruction below.***

After Dropbox installs, **right click** on the Dropbox icon  located in the lower right side of the screen, near the clock.

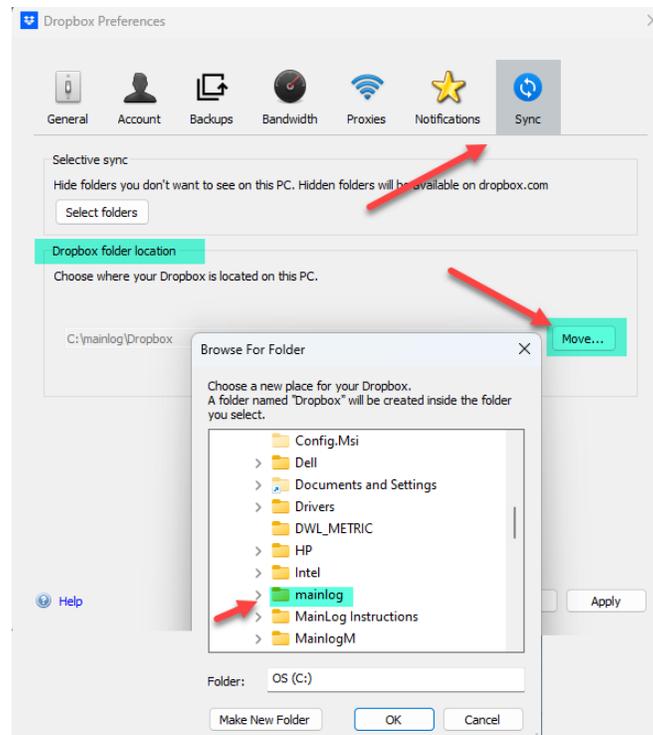


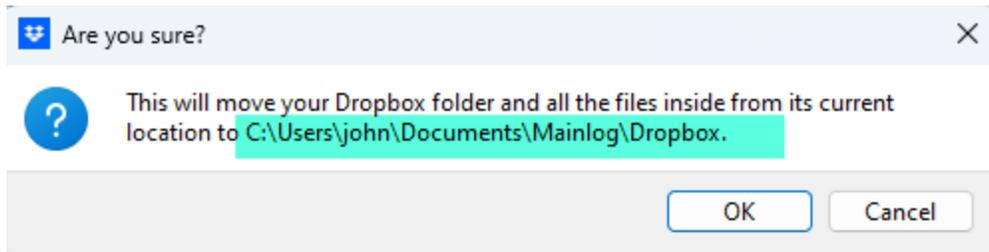
Click on your initials then select “**Preferences**”.



In the next dialog, select the “Sync” icon and under **Dropbox folder location** click on the “Move” button and browse to the MainLog folder. ***Note: the Dropbox folder must be in the MainLog directory for real-time to work!***

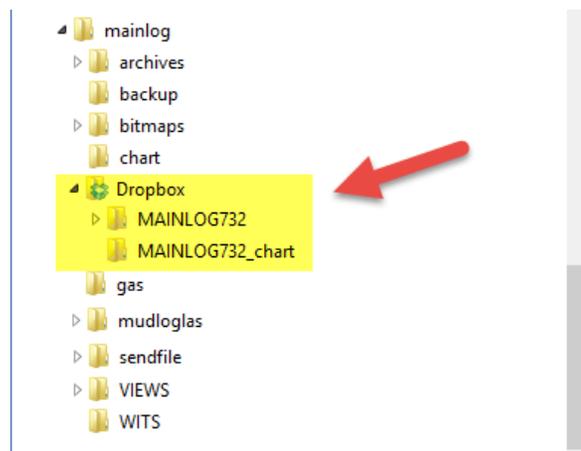
If you installed the Field version of MainLog, then Mainlog will be located on “C” drive. If you installed the Office Version MainLog will be located under the C:\User\Documents folder.





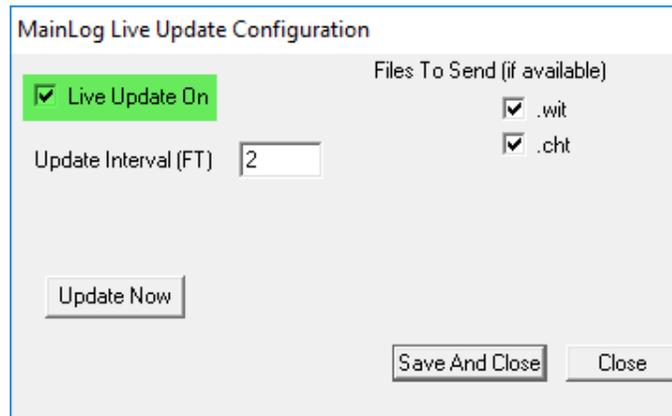
Once this is done, start Mainlog (**must start in drilling mode**). When Mainlog sees the Dropbox folder in the Mainlog directory, **it will create two sub-folders within Dropbox folder**, “Client ID XXX” and “Client ID XXX\_chart”, where the XXX is the SN (serial number) of the Mainlog key on the computer. The “Client ID XXX” folder contains the mudlog file & other associated files and the “Client IDXXX\_chart” folder contains the real-time gas chart files.

The “Client ID XXX” & the “Client ID XXX\_chart” are the folders to be updated and shared. Go to “Windows Explorer”, browse to the Mainlog folder, then to the Dropbox folder. Here you can verify that the Dropbox directory and folders are in the correct place.



When installed and activated, Mainlog will copy the selected files to the Dropbox folders anytime that they have changed.

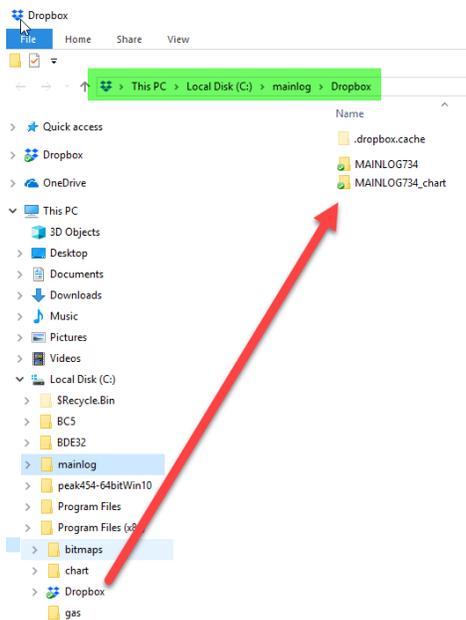
To turn on “Live Updates” go to “**Setup\Real Time Updates**”. Check the box “**Live Update On.**” From here you can select how often to update the “**Interval**”. The “**Update Interval (FT)**” is how often the log files are updated while drilling. Please note that anytime any of the files have made a change they will be updated regardless if any footage has been made. To send the “WITS” data it also must be selected.



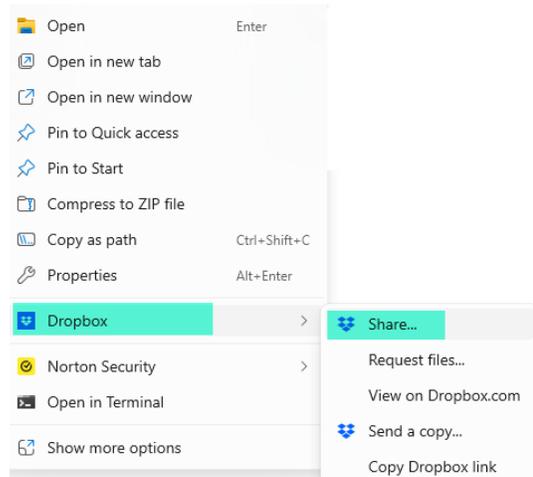
## Setting up Clients with “Dropbox”

The following list the steps that need to be taken in order for anyone to view your log real-time:

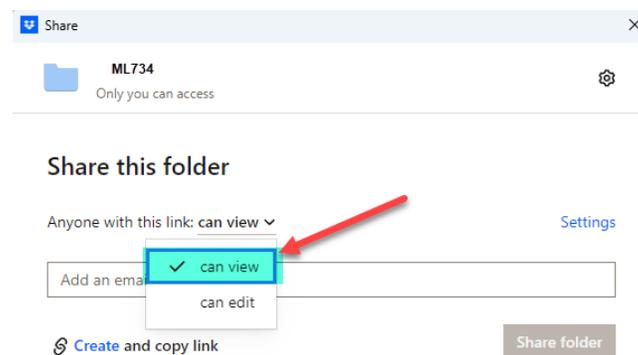
1. With MainLog running, under Setup, open “**Real Time Updates**” and check “**Live Updates On**” set to “**On**” from the setup menu, **open the “Dropbox” folder from the desktop icon. (Double clicking on the icon will open File Explorer.)**



2. Right click on the companyID**XXX**” folder. (xxx is the serial # to the drilling key) **\*\*\*You will need to do the following steps to share the “companyIDXXX\_CHT”, folder as well.**
3. Highlight “**Dropbox**” and click on “**Share**”



4. In the “Share” dialog, under **Anyone with this link:** choose **can view...**



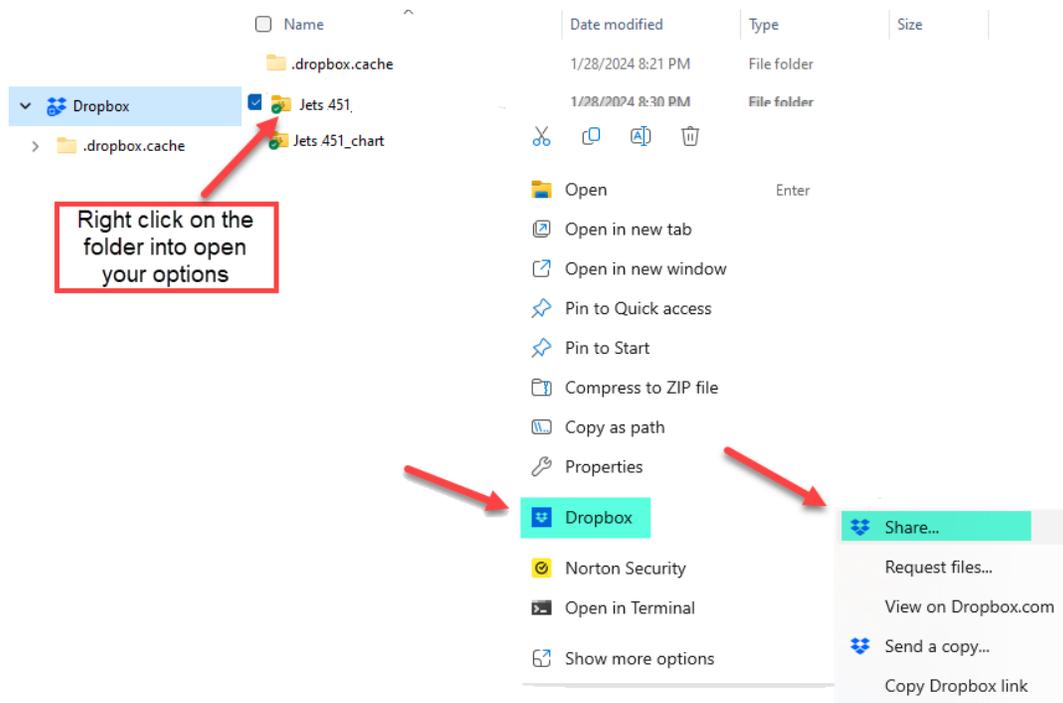
5. We recommend you choose this box if you don't want your customers inviting others. As the “owner” of the Dropbox folder, you can always add others.
6. Type in the e-mail addresses of the people you want to view the log real-time.
7. Click on “**Share folder**” on the bottom right. An invite will be sent by Dropbox to those e-mailed to view the folder. (hence the log)
8. The Dropbox website with your account will come up; just close it as it does not need to be open.
9. When the client receives the invite e-mail they will have a link to the Dropbox website and be instructed as they go. The process does not take long and once they have a Dropbox account it will be easy for them to view any future wells.

When a well is completed and a new well is started, MainLog will remove all files from the previous well in the c:\mainlog\dropbox directory. **The logger will have to send out new invites for the new well and must remove viewers from the previous well if the new well is for a different client.**

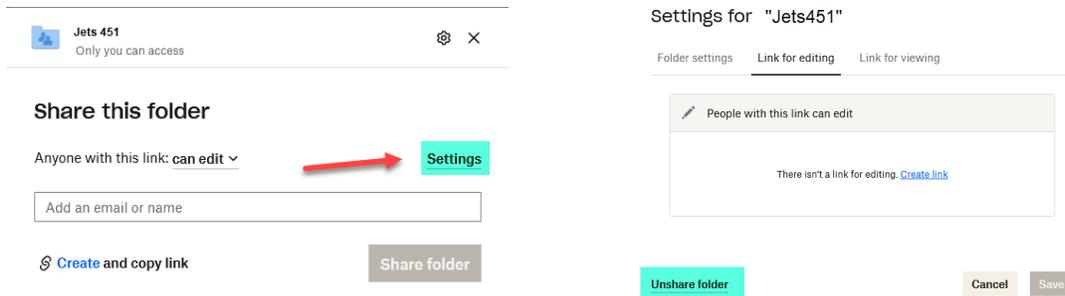
When a well is completed, and a new well is started, MainLog will remove all files from the previous well in the c:\mainlog\dropbox directory. **The logger must send out new invites for the new well and must remove viewers from the previous well if the new well is for a different client.**

**\*\*\*Note it is the mudloggers and mudlogging companies' responsibility to remove the people viewing the Dropbox folders after every well, unless of course the next well it is for the same oil company and geologists. This includes the "Client ID XXX chart" folder as well!**

To remove or edit viewers you must go to your account on the Dropbox website or from c:\mainlog\dropbox in Windows Explorer, right click on the shared folder and select "Dropbox"... "Share".



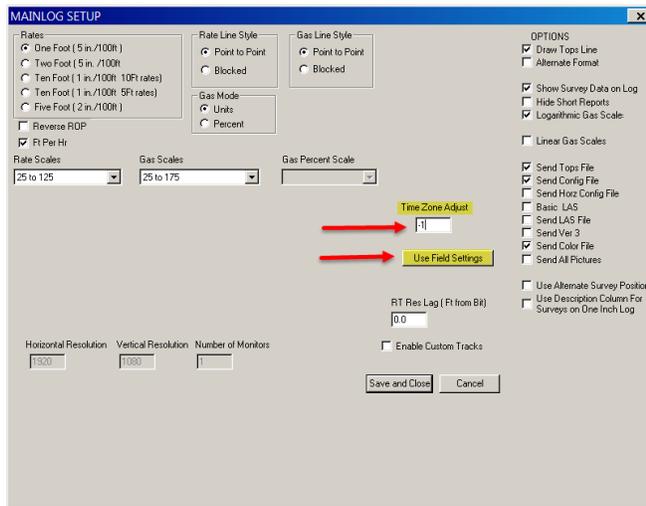
From here click on “Settings”...You can then edit or unshare the folder.



## Set-up Features when using Dropbox to view Logs

When viewing real time logs using Dropbox, MainLog has enabled some features to accommodate time zone differences between the logging unit and the viewers location and to allow the viewer to have “local” configuration file settings verses “field” settings.

It is quite common that the loggers and the real time viewers locations are in different time zones and if so, then their computers are set to different times. When this occurs and the viewer opens the WITS or Real Time Gas Charts the data will not be shown as current. To accommodate this, MainLog has added a dialog in the Set-up\Lines and Scales menu that allows the viewer to enter in a **“Time Zone Adjustment”**. **(This dialog will only be shown if MainLog detects that a log is being viewed from a Dropbox folder)** Example: if the viewer is on Eastern time and the logging unit is on Mountain time a value of -2 can be added. When the proper adjustment is made the viewer will see current data on the WITS and Real Time Gas charts. **MainLog reads the header file to see where the well is located to auto populate the Time Zone, but the user can adjust it if needed.**



When viewing a log from a Dropbox folder the “field” configurations or “settings” by the logger, are the default settings. The viewer, however, has the ability to select their own settings in the following dialogs; **Lines and Scales, Horizontal Options, Custom Tracks, Schemes, Log Colors and Tops.**

If the user goes in and makes any changes in these dialogs and saves them, MainLog will save them to the “local” or “home” directory and will use them when viewing the log. MainLog will also add a “button” to the dialog that was changed called, “Use Field Settings”, which the user can press to return to the “Field” configuration. (See above diagram) **When back to viewing the field configuration settings, the button will change to “Use Local Settings” so the user can toggle between local and field settings.**

There are other configuration settings that are strictly in the **“Local”** directory, these are: **WITS Chart, and the Real Time Gas Chart.** Configurations that are solely **“Field”** settings are: **Custom Lithology and Header.**

There are nine menu items in MainLog which are described in the links below:

- File Menu***
- View Menu***
- Options Menu***
- Enter/Edit Data***
- Setup Menu***
- Tops Menu***
- Schemes Menu***
- Import Menu***
- Help Menu***

## File Menu

The options below can be found under **File** on the toolbar.

*New*

*Plug Back for Horizontal or Sidetrack*

*Change File Name*

*Open*

*Backup*

*Restore*

*Save as Image*

*Archives All*

*Sendfile*

*Page Setup*

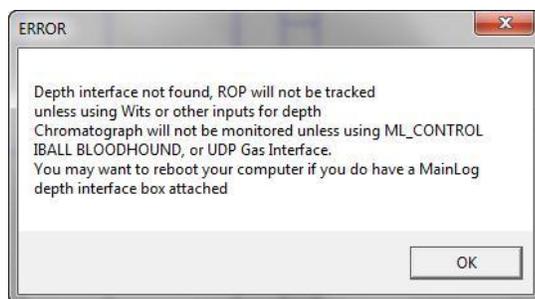
*Print*

*Exit*

## **New Starting a New Well File**

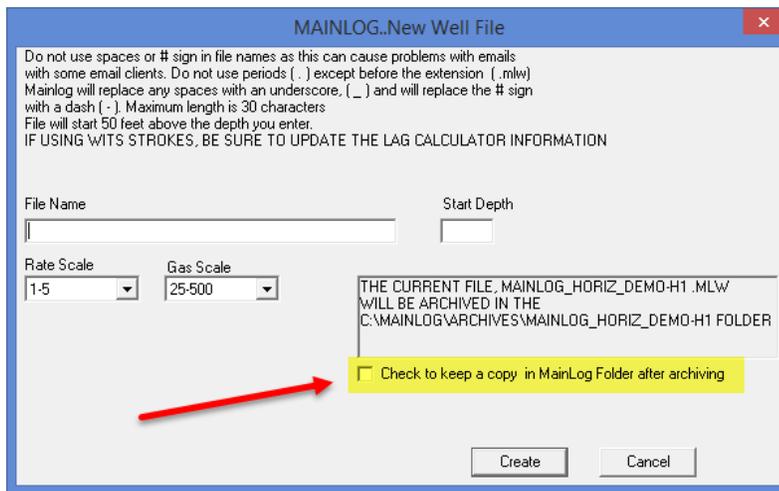
After installing MainLog, **and if this is the first time MainLog has been opened on the computer**, the mudlog file “elogdemo.mlw” or “first.mlw” will open. If there is no “Drilling” option from the Options Menu, click on **File\New** and enter in the well filename and depth to start logging. Click **“Create”** and the well should be in “Drilling” mode.

If MainLog has already been used on the computer and the program opens in “drilling mode”, you will get the following error message if no depth interface is found:



This is a reminder that depth will not be tracked if there is no depth interface. Just click OK.

To start your new well, select **FILE/NEW**, and the new file dialog will open.



If you have previously logged a well with MainLog on this computer, open the previous well file (if not already open) and Select **FILE/New**.

In the new file dialog, you will be prompted for a file name, and a start depth. Enter a depth shallower rather than deeper if not certain what depth you will start logging at. You can always make the file deeper, but there are some limits on making the file shallower after it has been created. There are some guidelines for naming the file, which you should read and follow. You can select scales if you want, but they can be changed any time, and at any depth later.

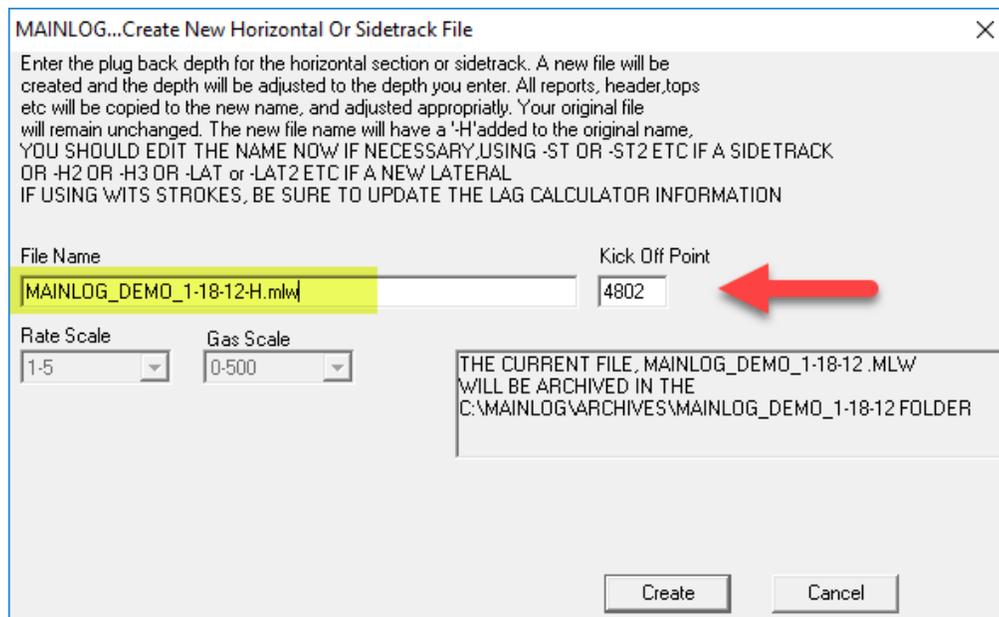
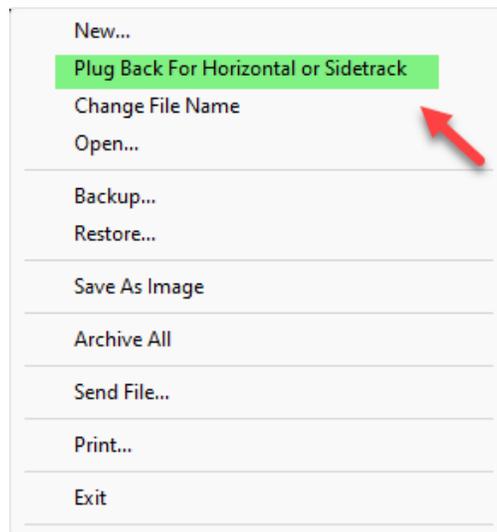
**MainLog archives the previous file** in the Mainlog\archive\<<filename> folder and unless you check the box, **“Check to keep a copy in the MainLog folder after archiving”**, the files will be deleted in the Mainlog folder. When you click **“Create”**, the new file will be created starting 50 feet above the start depth you entered and ending at the start depth you entered. The file is built as you drill from the current depth. If you need to make a depth correction to match the rig depth, click **Options/Correct File Depth**, and enter the correct depth.

**\*\***When a file is created, **and only if a WITS feed is being used for depth**, MainLog will not start tracking depth until the WITS depth is deeper than the file start depth.

With the latest version, for example, if you enter in a start depth of 2000’, the file will be created at 1950’, and MainLog will not log feet until foot number 2001’, **but only if using a WITS feed** and if **“Use Wits Depth”** is checked in the **Set-up Menu**. There is no need to get out of the program.

## Plug Back for Horizontal or Sidetrack

To create a new horizontal log or sidetrack log from the current file, click on **File\Plug Back for Horizontal or Sidetrack**. This menu item is used to create a horizontal or directional well from a pilot hole or to plug back and sidetrack. By selecting this, a dialog appears where a kick-off point can be entered.



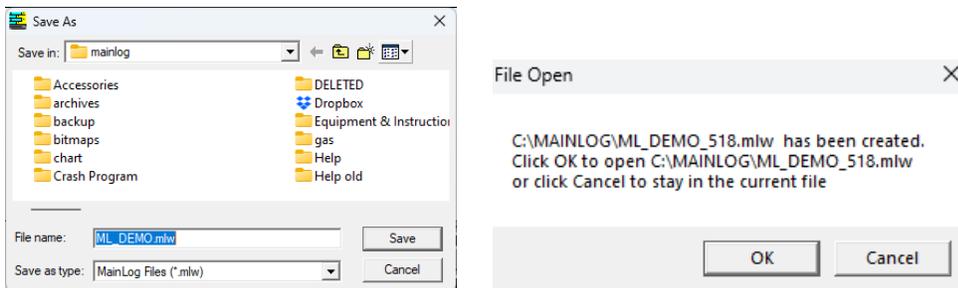
MainLog automatically creates a new file name by adding a “-H” to the original file, however, it can be named to anything. You should make sure the name makes sense, by changing the “-h” to “-H2”, or “-H3” “-ST1”, or “-ST2”, etc. to reflect the actual circumstances.

Once the “**Create**” button is clicked, all data below the KOP will be deleted and all information above remains including all reports. You are now working with a new file.

**\*\*\***The original filename will be archived in the C:\mainlog\archives folder **but will also remain in the C:\mainlog folder**. Should the kickoff fail, the original file can be re-selected by going to **File/ Open** and a new plug back or horizontal can be created from the new kickoff point.

## Change File Name

To rename a file click on **File** and select **Change File Name**. In the pop-up dialog change the name in the File name edit box to the new file name.



Click the **Save** button. MainLog will automatically close the drilling mode and a pop message will open telling you that a new file has been created and to open the new file “**Click OK**” or click “**Cancel**” to stay in the current file. Once selected go to **Options** and check **Drilling** to be back in drilling mode.

All auxiliary files (hdr, rpt, lag, etc.) will be copied to the new name except the backup files. **Note that the original file name will still be in the Mainlog folder and can be manually deleted.**

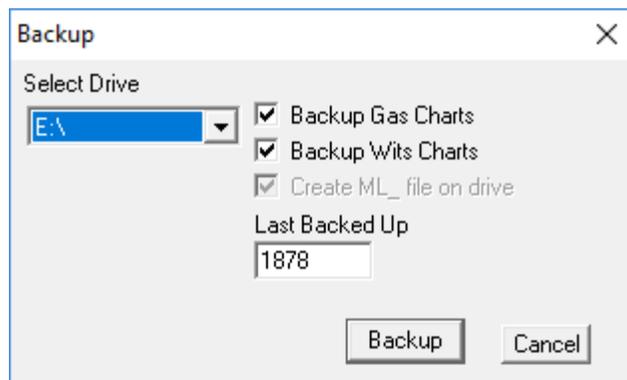
### **\*Open (Also available in Office mode)**

Displays a file open dialog with the default extension set to “mlw”. This is the default extension for a MainLog 32-bit windows data file. These files can only be read by the MainLog software. You can browse through the directory tree and open any MainLog files from any folder. However, only files in the home folder where the MainLog executable resides will be automatically updated when opened. To open any MainLog data file (.mlw) from any folder. Browse to the folder containing the file you want to open, select the file name from the list, and click open.

## Backup

**BE SURE TO BACK UP TO EXTERNAL MEDIA** (USB FLASH DRIVE OR CD) SO THAT IF YOUR COMPUTER DIES, YOU CAN COPY YOUR FILES TO ANOTHER COMPUTER FROM THE FLASH DRIVE ETC. (Note: backups work faster on flash drives rather than CD's)

The first time you back up **you will need to select the Flash Drive you are backing up to.** *Backing up to the "C" drive will not help you if your hard drive crashes. You must back up to an external drive. (Recommend a USB flash drive) Be sure it is an external drive and not a partition on the computer's internal hard drive.*



Once it is selected and then backed-up, MainLog will automatically back up the file every 100 feet but **will only backup** the mudlog file (.mlw), the Custom Track file (.mlx), the memo file (.mem), and the Horizontal Memo file (hxt). **This will occur every 100 feet, if the flash or thumb drive remains plugged into the computer.** MainLog will maintain the last 30 backups and will list them by the depth they were backed up to.

The logger still needs to back-up manually to back up the reports, header, show, DST, and configuration files. These files will only be backed up when they are changed, and the thumb drive is plugged in. If the thumb drive is removed, MainLog will still auto-backup to the c:\mainlog\backup folder, however, this does no good, if the hard drive crashes.

It is a good idea to back up regularly because the unexpected can happen at any time. To back up the file you are working in, look under ***file*** on the toolbar and select ***backup***. A dialog box will appear which will ask for which drive to save to. Make sure your disk is in the drive and select your drive (either d:\, e:\, or f:\ etc.) and click ***<Backup>*** to backup or click ***<Cancel>*** to abort. After clicking ***<Backup>***, it will back up to the drive and give a success message (including file size-make sure these numbers are the same or the backing up process did not work)

or an error message. Before backing up the file, MainLog will check the depth sequence for any errors and fix them if it finds any. After backing up the file, the backup file is checked for depth errors to make sure the disk can be read. When backing up, the mlw, rpt, hdr, sho, & dst files will be copied if they have changed since the last back up. Backing up to the C drive will not help you if your hard drive crashes. You must back up to an external drive. (Recommend a USB flash drive)

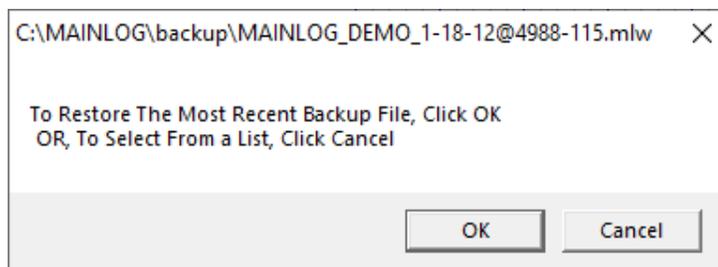
IF YOU THINK THE DATA FILE IS CORRUPTED **DO NOT** BACK UP, AS THIS WILL CORRUPT THE BACK UP FILE AS WELL!!!!!!!!!!!!!! CALL YOUR OFFICE OR MAINLOG BEFORE PROCEEDING.

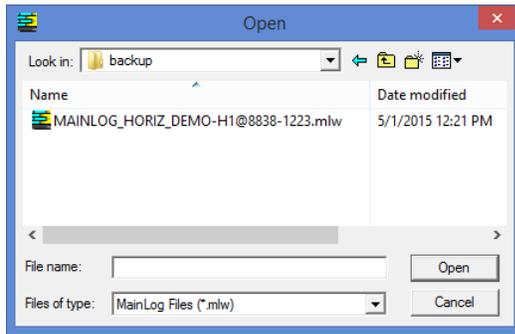
We highly recommend using USB Flash drives rather than CD's. **BACK UP OFTEN, IT TAKES ONLY A FEW SECONDS!!!!!!** If no external drive is available to back up to, creating a "Sendfile", (filename.ml\_) and e-mailing to the office is recommended.

## Restore

Every time a logger makes a **Negative Depth Correction, or Exits Normally**, MainLog makes a backup of the mudlog file at the depth and time the correction or exit was made and puts it in the **c:\mainlog\backup folder**. This feature enables the logger to restore back to the depth the correction was made at if a depth correction was made in error. (i.e. < [filename@9900-812.mlw](#) >).

When you click on **File\ Restore**, a dialog will open giving the option to restore the log back to the last depth correction that was made by clicking "**OK**" or click "**Cancel**", to manually choose the depth to restore from.

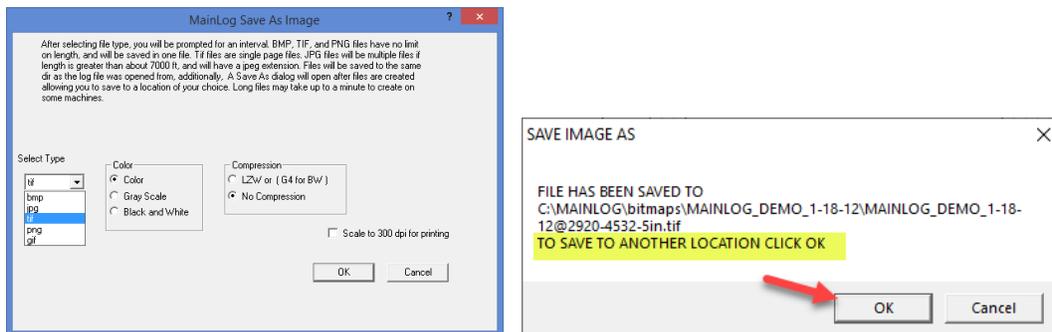




By backing up to an external thumb drive, the log can be restored from there as well. If a hard drive crashes, you can restore from the thumb drive to the last point that the file was backed up to. If you are unsure what to do call your supervisor or us at MainLog.

### \*Save as Image (Also available in Office mode)

This feature creates image files of the mudlog. These include png, bmp, jpg, gif and **Tif files**. After selecting the image type, you will be prompted to enter the log interval, which can be the entire well. After creating the image, the option of where to save it, is available.



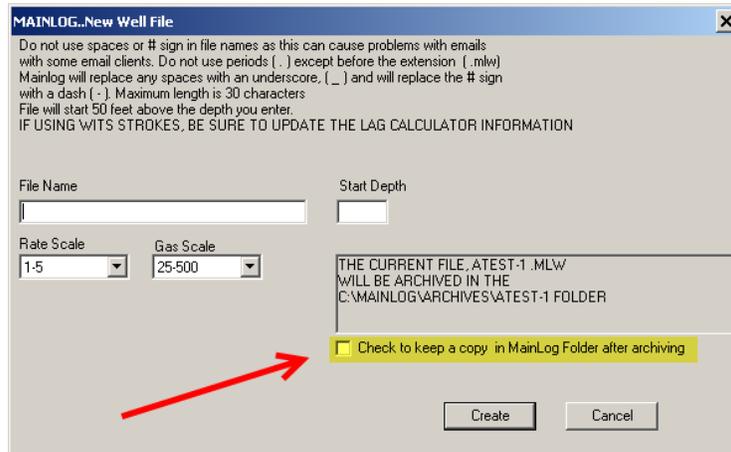
Note to create **PDF Files** go to the “Print” function, under **File/Print** and from “Set-up Printer”, select the “PDF Printer” to create the PDF file.

## Archives All

The **Archive option** is a way to “clean up” the **c:\mainlog** folder. By choosing this, MainLog zips all the MainLog wells (**except for the current well opened**), and their associated files, including WITS files, pictures, reports, and gas charts in the MainLog folder and moves them into the **c:\mainlog\archives** folder. Each well will have its own folder. If there are more than twenty wells in the MainLog

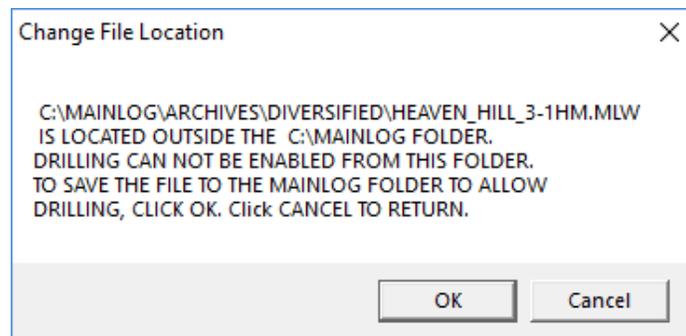
folder you will have to repeat the process.

**When you create a new well**, MainLog **automatically archives** the previous well into the c:\mainlog\archives\you have the option to save a copy of the previous log in the MainLog directory. **When pad drilling**, it may be useful to maintain a copy of the well in the **c:\mainlog** folder to easily go back to.



To repeat, whether you check the box to keep a copy in the MainLog folder, the well **is archived in the c:\mainlog\archive\wellname folder.** If you do not want to maintain copies of the logs on the field computer, you must manually delete them from the **c:\mainlog\archives** folder.

If you open a log from the Achieves folder and try to put it into drilling mode, you will have the option to have the log and associated files to be moved to the **c:\mainlog** folder where it can go into drilling mode.



For those using the Dropbox feature for viewing the log real time, MainLog will delete files from that folder when a new well is created. If you have used the “C” drive on your computer to back up the well to, copies of your log will be there as

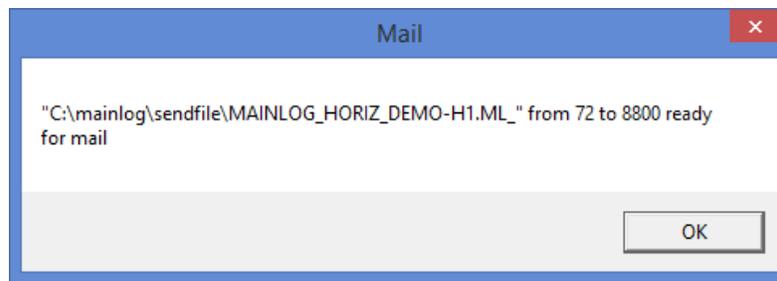
well. We highly recommend you use a thumb drive to back up your files to rather than the c drive. If your computer crashes, there will be no way to retrieve your back up on c drive.

It is a good idea to periodically remove all old wells from the archive folder on the logging computers and archive them in a more permanent way in the office. This will prevent accidental loss in case of a hard drive failure, or if a computer is lost or stolen.

**\*Sendfile (Also available in Office mode)**

To send files by E-mail click **FILE/SENDFILE...**

The file created, (<**filename.ml\_**>) is a zipped file which contains the complete log file and all support files with some exceptions. **\*\*** The zip file that is created will be in the **c:\mainlog\sendfile folder**, that can be attached to an e-mail.



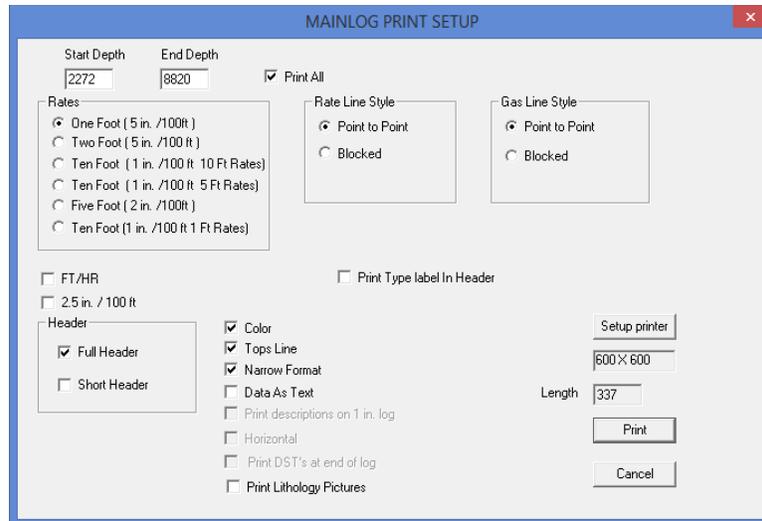
**\*\***The exceptions are separate “**Options**” under **Setup\Lines and Scales**. These include sending Tops files, LAS files and various configuration files. In general, the config files are on by default, so the client opening the email will see the same configuration, including format and log colors from the field. If that is an issue for the client, you can uncheck the various SEND “cfg” boxes and the configuration will be controlled on their end.

Pictures can also be selected from Setup\Lines and Scales to be included when creating a “Sendfile”. See **Send Pictures**.

**\*Page Setup (Also available in Office mode)**

This displays a printer page setup dialog box to allow the setting of paper size, and or changing printers etc. It is also available directly from the print dialog box.

**\*Print (Also available in Office mode)**



This displays a print dialog which allows you to select print interval, line styles, formats, and scales to use for this print job. It also provides access to printer setup if needed.

From the print setup, you can print a 1”, 2” or 5” log in either 1-foot, 2-foot or 10-foot drill time and in either point to point, or blocked formats. You can also select the depth interval to be printed. By checking “Print All”, the entire well including the header will be printed. The log can also be printed in FT/HR, including, a 2.5” log. One-inch logs can be printed with or without descriptions by checking the appropriate box.

By checking the appropriate box from the print setup, the log can be printed in color, with or without “Tops Lines” (page) and in a wide or narrow format depending on the width of the paper. By checking “**data as text**” the numerical data will be printed out in spreadsheet form including depth, lag depth, drill time and gas readings.

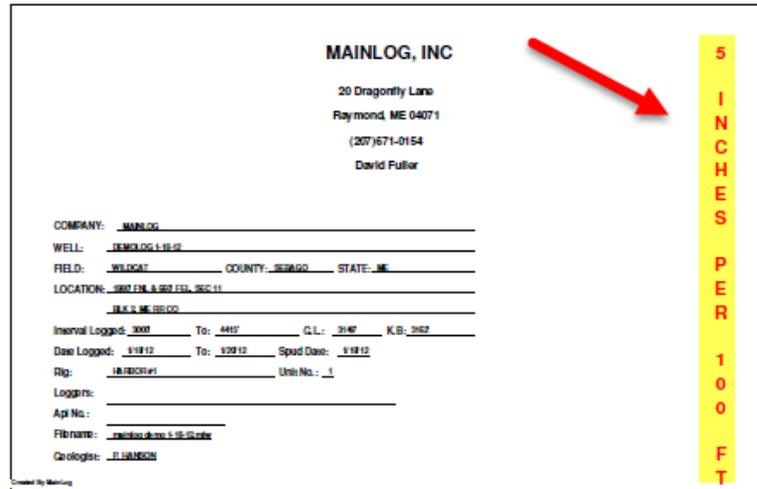
**To print a horizontal log, it first must be on screen,** (“Horizontal will be grayed out in Print Setup if it is not on screen). Click on **View Horz** from Quick View, then click **File/Print**, and select “**Setup Printer**”. The printer must be on “**Landscape**” and “**Banner Mode**” (not all printers may have this ability). Click on properties to check the settings as shown on the next figure. **\*\*Note:** in some cases, banner will not work, and you must set the “**Paper Size**” to “**PostScript Custom Page Size**” and set the height to 200 (inches).

Any DST reports can be printed at the end of the log by checking, “**Print DST’s**”

at end of log”. Also, any imported lithology jpegs can also be printed by checking, “Print Lithology Pictures”. The “Print Type label in Header” will print a label in the header signifying whether the log is a 5”, 2” or 1” log.

### Print Type Label in Header

When “Print Type Label in Header” is checked, MainLog will add to the printed header, in bold red letters, the type of log it is; **5 INCHES PER 100 FT**, **5-INCH PER 100 FT** or **1-INCH PER 100 FT**.

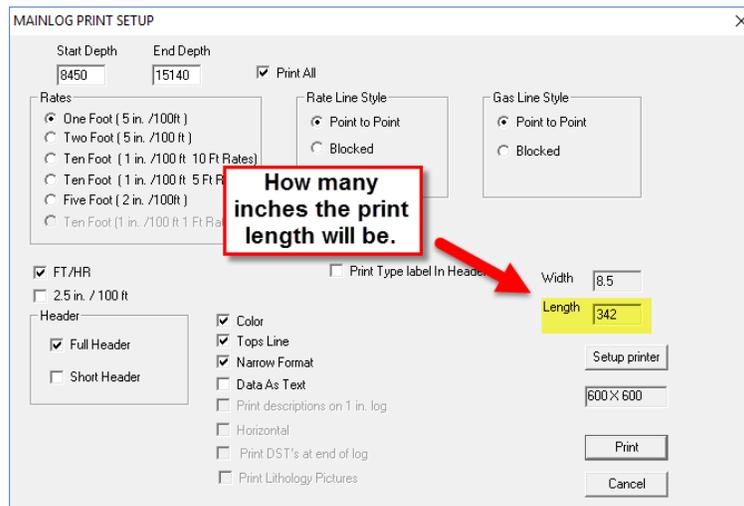


The image shows a screenshot of a log printout header. At the top center, it says "MAINLOG, INC" followed by the address "20 Dragonfly Lane, Raymond, ME 04071" and phone number "(207)671-0154". Below that is the name "David Fuller". The header contains several fields for log details: COMPANY: MAINLOG, WELL: DEMOLOG-10-10, FIELD: WELDCAT, COUNTY: WINDSOR, STATE: ME, LOCATION: SECTION 8 AND 10, SEC 11, T10N R10E BELOO, Interval Logged: 3000 To: 4415 G.L.: 3147 K.B.: 2622, Date Logged: 8/18/10 To: 8/29/10 Spud Date: 8/18/10, Rig: HANSON1 Unit No.: 1, Loggers: [blank], Api No.: [blank], Filenme: mainlog.demo.10-10-10, Geologist: J. HANSON. On the right side, there is a vertical yellow bar with the text "5 INCHES PER 100 FT" written vertically in red. A red arrow points from the top right towards this label.

### \*PDF Files & PDF's with Custom Tracks On (Also available in Office mode)

To create a PDF file, you will need to go to the “Print” function and from “Setup Printer” select the PDF driver to create the file. You must have a PDF program installed on your computer such as, Adobe, if you do not, you can get a “freeware” version of **CutePDF**, by going to [www.cutepdf.com](http://www.cutepdf.com) or **PrimoPDF** by going to [www.primopdf.com/](http://www.primopdf.com/).

Click **File/Print** and select “Setup Printer”. Choose the PDF driver and go to “Properties”. For vertical wells, the print orientation must be on “Portrait”. The print dialog also shows the length of the print job. If you want to minimize page breaks, select “Advanced” and set the “Paper Size” to “PostScript Custom Page Size” and set it to the proper length. The maximum height (length) is 200 inches which is about 4000’ on a five-inch log. Click OK on each of the dialogs, then “Print”.



The file will be created and default to the name, “Mainlog.pdf”. At this point you have the option of renaming the file and saving it to any directory or if you choose to save the file to the “MainLog” directory, the software will automatically rename the file to the well name, depth it was created at and type of log, 5”, 2” or 1 (Example: Horiz\_DemoH1@8654-5inch). In the field install the file will be saved to; <c:\mainlog\sendfile>. In the office program, it is either installed in <c:\program files\mainlog\sendfile directory or in Windows 7 it goes to the user documents folder (wherever that may be) \mainlog\sendfile.

**\*\*When a “ML\_” file is created from “File\Sendfile” for e-mailing, the PDF file is not included and must be attached separately. Also, all PDF files in the sendfile directory will be deleted when the ml\_ file is created, so if you must e-mail PDF files along with the MainLog file, create the “ml\_” first, then the PDF’s.**

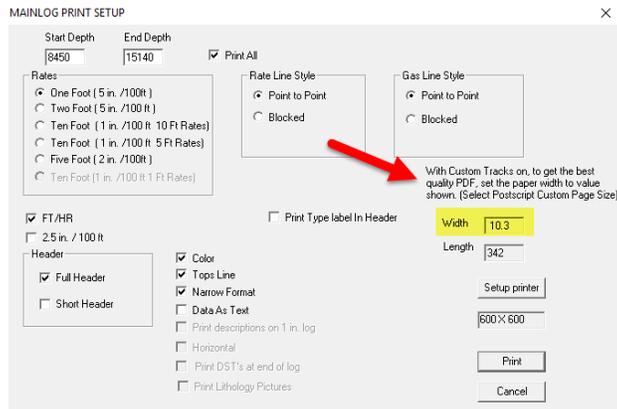
**There may be a 10+ second delay before the file shows up in the sendfile folder. IMPORTANT!! Create the sendfile FIRST, and then the PDF, or MainLog will delete the PDF when it creates the ml\_.**

## PDF’s with Custom Tracks On

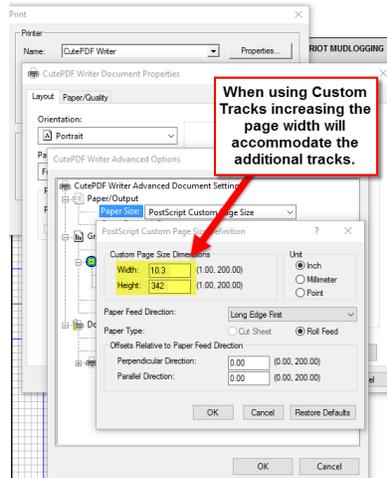
When creating a PDF **with Custom Tracks on**, many loggers are not aware that they can **make the page wider**, which is highly recommended and should be done. If left at “letter” or 8.5” wide, MainLog will compress the log width to fit the page, which has limits. If the width is set appropriately no compression is needed, and the PDF will look much better. With Custom Tracks off, the “letter” setting is fine, and making the page wider will have no effect.

**With Custom Tracks on**, click **File/Print**. The print dialog will display the width value needed to correctly print the PDF. It will also display the length (height) of

the print job which can be used to minimize page breaks on the PDF. (200 inches max)



Click on “Setup Printer” and select the PDF printer driver. Next go to “Properties” and select “Advanced”. Set the “Paper Size” to “PostScript Custom Page Size”. Change the “Width” to the recommended value and, if needed, the height (length) to minimize page breaks. Then click “OK” on each of the dialogs, then “Print”.

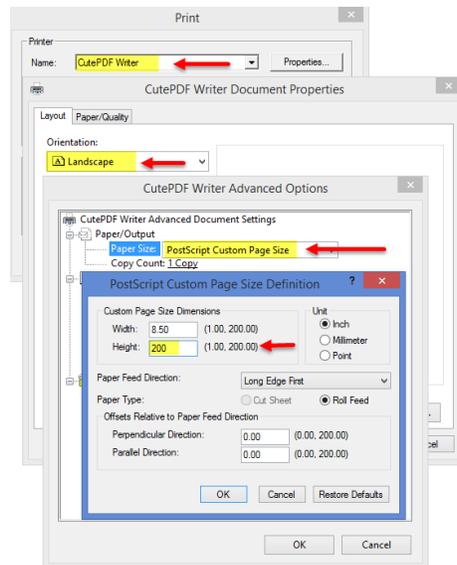


This will make for a better-looking PDF of the log, correctly accommodating the font size and width size of each of the columns on the log.

### Create a PDF of the horizontal log.

To create a **Horizontal PDF**, it first must be on screen, (“Horizontal will be grayed out in Print Setup if it is not on screen). Click on **View Horz** from Quick View, then click **File/Print**, and select “Setup Printer”. Choose the PDF driver and go to “Properties”. **The print orientation must be on “Landscape”**. Next select “Advanced” and set the “Paper Size” to “PostScript Custom Page Size”. Set the

height, (length) to the value recommended in the print dialog. (200 inches max)



Select “OK” on all the dialogues and then print.

## Exit

This exits or closes the MainLog Program. When the program exits a copy of the mudlog, MLW file, is made to the backup drive.

## \*View Menu (Some are available in Office mode)

These options can be found under *View* on the toolbar:

*Morning Report*

*Short Report*

*Header*

*Show Report*

*DST*

*Bit Record*

*Data as Text*

*E-Log Data as Text*

*Horizontal*

*Real Time Gas Chart*

*WITS Chart*

*End of Well Report*

*Down Time Report*

*TVD log*

Navigation throughout these options is relatively simple. Use <enter> or <tab> to move between fields.

<**Save**> This button (if available) will save any work done on the current report on screen, even when going back and correcting information. If this button is not pressed, no new work will be saved.

<**New**> This button (if available) will allow you to make an additional or new report or DST

<**Delete**> Is only available on the Office Edit Key. It allows you to delete the specific report that is open.

<**Previous**> Allows you to scroll back through previous reports or DST's.

<**Next**> Allows you to scroll forward through reports or DST's.

<**Print**> Allows you to print reports or DST's.

<**Close**> This exits either your report or DST. If you do not save before closing, no additional information will be saved.

<**Save Short Report**> In drilling mode only, will save a short report at the current morning report depth. See short reports below.

**\*Morning Report** (Cannot create reports Office mode, but can view & Print)

By clicking on the Morning Report, the last report created will come up. From here you can view and print previous reports, create a new report, save it as a text file or save it as a “**Short Report.**” When saved as a Short Report, the drilling and mud parameters are automatically saved to the Short Report at that depth and then can be accessed and easily added to the log. See, **Short Report**

MAINLOG MORNING REPORT

Use format... month-day-year [12-12-04]

DATE: 11-29-2016 Report No.: 20 Report Time: 3:25 PM UNIT PHONE: Save Short Report Save

SPUD: START LOGGING: DAY NO: 0 DAYS LOGGING: 0 DOWN DAYS: 0 EST TD: 0 New

DEPTH: 8871 PRESENT OPERATIONS: drilling Delete

FOOTAGE SINCE LAST REPORT: 409 HRS ON BOT: 6.95 AVG ROP: 58.8 Next

LAG TIME: 44 min, 5720 stk SURVEY: MD 8634' TVD 5794.1' AZM 239.3 INCL 93.6 Previous

FORMATION: NEXT TOP: Print

	TOT	C1	C2	C3	IC4	NC4	DEPTH	SOURCE	FLARE	CHOKES
BACKGROUND GAS:	1242	944	129	87	0	64		<input type="checkbox"/> SEP		
MAX FORMATION GAS:	1785	1522	111	76	0	64	At 8758	<input type="checkbox"/> SEP		
MAX CONNECTION GAS:	0	0	0	0	0	0	At 0	<input type="checkbox"/> SEP		
MAX TRIP GAS:	0	0	0	0	0	0		<input type="checkbox"/> SEP		

LITHOLOGY: 100% carbonaceous shale at 8818

MUD PROPERTIES:@ 0

WT OUT: 9.1 WT IN: VIS: 74 PV: 0 YP: 0 GELS: PH: 8.7 FIL: 6.6

HT.HP.FI: CAKE: 3/32 PM: 0.00 PF: 0.00 MF: 0.00 CHL: 800 CA: SD: 0.00 SOL:

OIL: 0.00 H2O: 0.00 O/W: ELEC STAB: 0.00 CACL: 0.00 SALT: 0.00

XLLM: 0.00 LCM: 0.00 DAILY COST: 0.00 TOTAL COST: 0.00

DRILLING PARAMETERS:

WOB: 9K RPM: 160 PP: 2100 SPM: 130

COMMENTS:

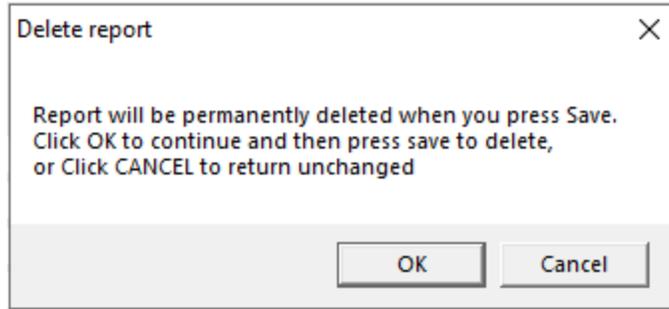
Print Surveys

Printer Setup

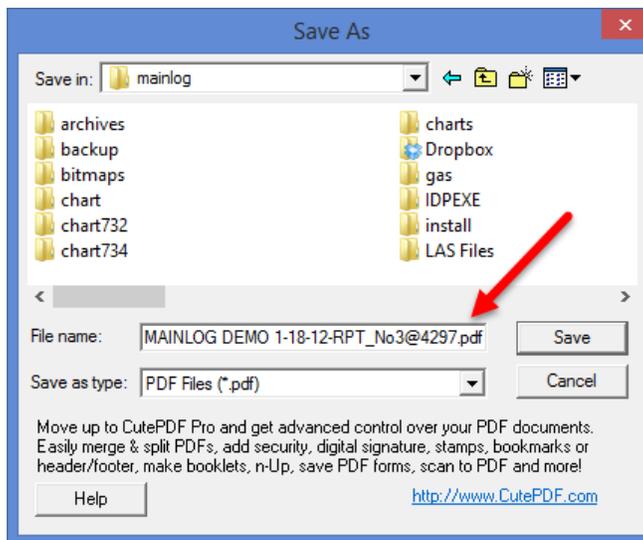
CLOSE

To create a new morning report, click on “New” from the report on screen and MainLog will automatically calculate how many feet were drilled from the last report, how many ft/hr, what the background gas is, maximum gas since the last report, any downtime gas and will also populate the date, company, report time, well name, lag time and fill in the mud data from the previous report which can then be edited. When a morning report is created, and saved, the letter “R” in a yellow box will appear in the ROP column.

**The “Delete” button on the Morning Report will delete the specific report that is currently being displayed. A message will appear with the option to cancel. We recommend backing up prior to deleting a report, as once “OK” is selected, the report will permanently be deleted.**



Morning Reports can be printed as a PDF. Surveys can be printed on the report by checking the box, "Print Surveys". From the Report Menu choose "Printer Setup" and select your PDF software program and then "Print". Save the PDF report to the MainLog directory and MainLog will automatically add the depth & RPT to the filename and save it to the C:\Mainlog\Sendfile directory for emailing.



MAINLOG, INC  
DAILY DRILLING REPORT

DATE: 11-29-2016 3:25 PM      SPUD: _____ START LOGGING: _____ DAY NO: 0      DAYS LOGGING: 0 DEPTH: 8871      EST TD: 0 OPERATIONS: DRILLING FT. MADE: 409    HRS: 6.95    ROP: 58.8 FT/HR	OPERATOR: BIG OIL LLC WELL NAME: HORIZONTAL TEST WELL CO. ST: A COUNTY IN, TEXAS      PHONE: _____ LEGAL: THE GREAT US OF A CONTRACTOR: _____ LOGGERS: _____      UNIT NO: D-100
--	---

BACKGROUND GAS	1242	UNITS	FLOWLINE <input checked="" type="checkbox"/>	SEP <input type="checkbox"/>	FLARE	_____ FT	CHOKES	_____ PSI	
C1	944	C2	129	C3	87	IC4	0	NC4	64
MAX FORM GAS	1785	UNITS	FLOWLINE <input checked="" type="checkbox"/>	SEP <input type="checkbox"/>	FLARE	_____ FT	CHOKES	_____ PSI	
C1	1522	C2	111	C3	76	IC4	0	NC4	64
MAX CONN GAS	0	UNITS	FLOWLINE <input checked="" type="checkbox"/>	SEP <input type="checkbox"/>	FLARE	_____ FT	CHOKES	_____ PSI	
C1	0	C2	0	C3	0	IC4	0	NC4	0
MAX TRIP GAS	0	UNITS	FLOWLINE <input checked="" type="checkbox"/>	SEP <input type="checkbox"/>	FLARE	_____ FT	CHOKES	_____ PSI	
C1	0	C2	0	C3	0	IC4	0	NC4	0
LAG TIME/STROKES: 44.0 MIN, 5720 STK									

% LITHOLOGY @	100% CARBONACEOUS SHALE AT 8818	
FORMATION	_____	NEXT TOP _____

MUD CHECK @	0 FT	
WT	9.1	WT IN _____
VIS	74	PV 0    YP 0    GELS _____
PH	8.7	FL 6.6
HT.HP.FL	_____	FC 3/32    FM 0.00    PF 0.00    MF 0.00    CL 800    CA _____
SD	0.00	% SOL _____
OIL	0.00	% H2O 0.00    % O/W _____
ELEC STAB	0.00	CACL 0.00    SALT 0.00
EXLM	0.00	LCM 0.00    DAILY \$ 0.00    TTL \$ 0.00

RIG FUNCTIONS:
WOB 9K    RPM 160    PUMP PRESS 2100    SPM 130    DEV MD 8634' TVD 5794.1' AZM 239.3 INCL 93.6

REMARKS & SURVEYS:
MD 8480 INCL 93.50 AZM 239.30 TVD 5801.63 VS 2848.39 MD 8512 INCL 93.30 AZM 239.10 TVD 5799.73 VS 2880.31 MD 8548 INCL 93.60 AZM 239.30 TVD 5797.57 VS 2916.22 MD 8568 INCL 93.60 AZM 239.30 TVD 5797.60 VS 2916.00 MD 8604 INCL 93.60 AZM 239.30 TVD 5794.12 VS 2971.08 MD 8634 INCL 93.60 AZM 239.30 TVD 5794.10 VS 2971.00

**NOTE:** It is important to have **Gas Labels** on all connections, downtime, survey and trip gases by using a note or memo within 2 ft of the peak and using the following abbreviations: **Carbide Lag Test - "CLT"**, **Trip gas - "TG"**, **Downtime Gas - "DTG"**, **Survey Gas - "SVY" or "SG"** and **Connection Gas - "CG"**, MainLog will automatically populate these to the morning report when it is created. If the abbreviations **"TTG"**, **"TT"** or **"Trap"** are used for **Trap Test Gas**, MainLog will disregard the gas readings for use in the morning report.

It is important to add these abbreviations so that they are not used as "maximum formation gas" in the report by MainLog when the report is created.

## Short Report

A short report is a quick and easy way to put mechanical and mud data onto the mudlog. **It can be created manually or from a morning report.** To create a Short Report, click on **View\Short Report** or right click on any previous Short Report to open the Short Report dialog and click on the “**New**” button and enter in the new depth from the edit dialog. Enter the new data, **Save and Close**.

The dialog has numerous options such as **placement on the log, text color, background color, whether to draw a rectangle around the text, etc.** There are four “Custom” lines which could be used to enter in such data as “Bit” information.

MAINLOG SHORT REPORT

Report Depth 5330 No. 16

**MECHANICAL DATA**

WOB 8  
RPM 90  
MMRPM  
PP 1038  
SPM 53  
CUSTOM  
CUSTOM  
POSITION 2

Draw Rectangle around Mech Data  
 Draw On One Inch Log  
 Draw On Horizontal

Mech Text Color  
RD=0 GN=0 BL=0

Mech Background Color  
RD=255 GN=255 BL=255

Align Mech Reports

**MUD DATA**

WT IN  
WT OUT 9.1  
VIS 38  
PH 10.5  
PV 8  
YP 6  
CUSTOM GEL STR 5-16  
CUSTOM  
CUSTOM  
Position 18

**TYPE**

Mechanical Data Only  
 Mud Data Only  
 Mechanical And Mud Data

PREV NEXT  
NEW DELETE  
SAVE CLOSE

Draw Rectangle Around Mud Data  
 Draw On One Inch Log  
 Draw On Horizontal

Mud Text Color  
RD=0 GN=0 BL=0

Mud Background Color  
RD=0 GN=0 BL=0

Align Mud Reports

Change Text and Background color and easily align reports to a certain position.

Another feature, **Aligning Short Reports** is an easy way to put a short report at the same position on the log. Open the report dialog at the depth you want to start the alignment at, type in the **Position** number and check the appropriate Mechanical or Mud Report. The report will move all the reports from that depth on, to the new position on the log.

Another way to create a short report is to click the “**Save Short Report**” button after creating a new morning report. You can also scroll to the morning report number that you want to save a short report from and click the “**Save Short Report**” button to create a short report from that report’s information.

MAINLOG MORNING REPORT

DATE: 5/30/2012 Report No: 103 Report Time: 4:10 AM UNIT PHONE: 0010812

SPUD: 04/13/02 START LOGGING: 04/26/02 DAY NO: 48 DAYS LOGGING: 47 EST TO: 0

DEPTH: 14283 PRESENT OPERATIONS: (Continuing)

FOOTAGE SINCE LAST REPORT: 237 WFS ON BOT: 142 AVG ROP: 116.3

LAST TIME: 172 min, 765 gr SURVEY: 24 @ 14,200

FORMATION: Main Pay NEXT TOP:

	TOT	C1	C2	C3	C4	NC4	DEPTH	SOURCE	FLARE	CHOKES
BACKGROUND GAS:	1134	178	146	113	133	0		SEP		
MAX FORMATION GAS:	267	128	89	52	142	0	AI	1492		
MAX CONNECTION GAS:	0	0	0	0	0	0	AI	0		
MAX TRIP GAS:	7155	3063	1717	458	137	0		SEP		

LITHOLOGY: SOL: sdrwtr, 10% shale

MUD PROPERTIES: WT 14.260 VS 550 REO 0 PV 0 YP 0 BELS PH 10.5 FL 6.4cc

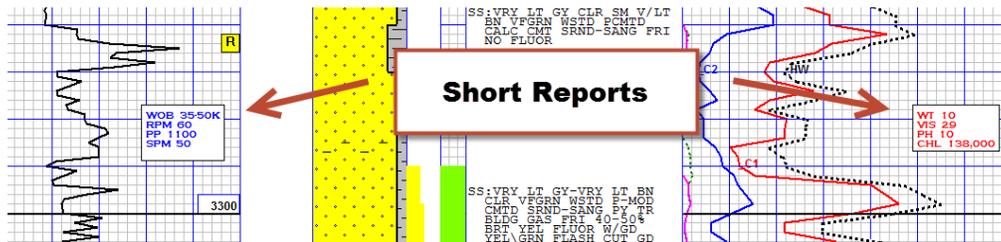
HT HP PI CASE 2 PM 0.00 PF 0.00 MF 0.00 CHL 53K CA SD 0.00 SOL

OIL 0.00 H2O 0.00 D/M ELEC STAB 0.00 CALCL 0.00 SALT 0.00

N.L.M 0.00 LCM 0.00 DAILY COST 0.00 TOTAL COST 0.00

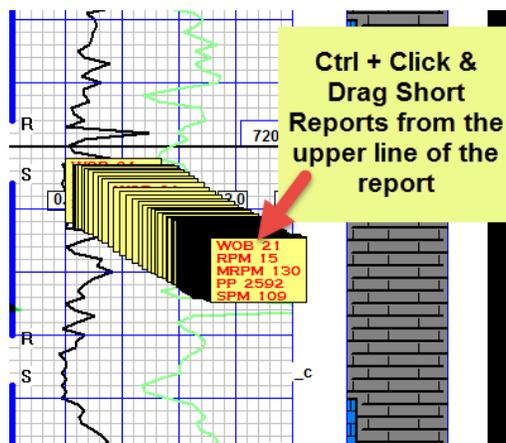
DRILLING PARAMETERS: WOB 175K RPM 120 PP 129 SPM 68

COMMENTS:  
Top for Bit @ 14170. Back on bottom @ 2:00am. Drilling ahead.



It is possible to have more than one short report at the same depth, provided the locations allow them to be displayed without interfering with each other. The Short reports can be turned on and off in SETUP...LINES AND SCALES, by checking or un-checking “**Hide Short Reports**”.

**Short Report’s** can be moved by “**Ctrl + left Click & Dragging**” from the **upper line** of the report. Please note when a short report is moved to a different depth, the data in the report still pertains to that depth it was created at.



If the Drilling Report and the Mud Report **are both selected to be viewed from the same short report**, then the **mud report will be controlled vertically on the log by movement upward or downward of the drilling report**. The mud report can only be moved horizontally in this scenario.

**If the only the Mud Report is selected** to be displayed from a short report, it can be moved independently in any direction on the log.

**\*\*Note: when short reports are selected to be on the horizontal log; they become “Horizontal Memos” and can be edited and moved from the Horizontal Log view.**

### **Header (Editing also available in Office mode)**

The **Header** is one of the first tasks a logger should fulfill when starting a new well, **in particular GL and KB**. This information is used by the program when creating reports, calculating subsea for tops and for correlation when importing offset ROP or offset gamma.

Note, the ELOG KB on the Header is for the gamma curve that has been selected to be displayed on the log. If it's the gamma from MWD on the well, then the ELOG KB is the same as the K.B. on the header. If an offset gamma has been selected to be on the log, then that KB should be entered as the ELOG KB.

### **Show Report (Also available in Office mode)**

Enter a show interval when clicking on “**Show Report**”. Once entered, MainLog will automatically calculate and populate what the drill time and gas readings where, before, during, and after the show interval. The logger can fill in the description and show information. Up to three pictures in the show interval will be included in the report.

MAINLOG SHOW REPORT

SHOW NO.:  SHOW INTERVAL: 6288 to 6336

COMPANY: Big Oil LLC

WELL: HORIZONTAL TEST WELL

FORMATION:

LITHOLOGY:

DESCRIPTION:

ROP ABOVE: 21.8 R/hr

ROP DURING: 76.4 R/hr

ROP AFTER: 37.9 R/hr

PDR:

FLU:

CUT:

COMMENTS:

	HW	C1	C2	C3	IC4	NC4	IC5	NC5
GAS ABOVE:	172	141	23	7	0	0	0	0
GAS DURING:	644	465	104	49	4	12	2	0
GAS AFTER:	220	148	41	21	1	4	2	0

Once a show report is created and saved, the letter **“S”** in a red box will appear in the ROP column. Show Reports can also be made from the Office Version as a drilling key is not necessary.

Show Reports can be printed as a PDF. From the Report Menu choose “Printer Setup” and select your PDF software program and then “Print”. Save the PDF report to the Mainlog directory and MainLog will automatically add the **“depth-SHOW”** to the filename and save it to the **C:\Mainlog\Sendfile** directory for emailing.

**\*DST**

DST reports can be filled out and be saved; the letter **“D”** in a green box will appear in the ROP column. **(Available in Office mode)** A depth interval for the DST can be displayed on the log. See **Out-Line**, for instructions.

DST Reports can be printed as a PDF. From the Report Menu choose “Printer Setup” and select your PDF software program and then “Print”. Save the PDF report to the Mainlog directory and MainLog will automatically add the **“depth-**

**DST**” to the filename and save it to the C:\Mainlog\Sendfile directory for emailing.

## Bit Record

Bit records can be added from the start of the well or, if preferred, just the section that is being mudlogged. Bits can be added in any order, but it is more useful to add them sequentially so that the various calculations can be made in the section that is being logged. MainLog will automatically calculate the number of feet drilled, hours on bottom and average ROP from the previous bit.

Obviously if a bit was put in prior to the logging depth the first bit record will lack that data, but it can be manually entered. Be sure to enter in the actual bit number from the rig.

The bit record can be saved to a text file and can also be saved as a memo at the depth the bit was put in. Being a memo, it can be edited or moved like any other memo.

## \*Data as Text

This displays a dialog box with much of the raw data used to draw the current screen displayed. It also includes Test Gas values. **The data is not editable.** The dialog will update as you navigate through as the file. The data can also be printed out from the **Print** menu by checking the box **“Data as Text”**. (Available in Office mode)

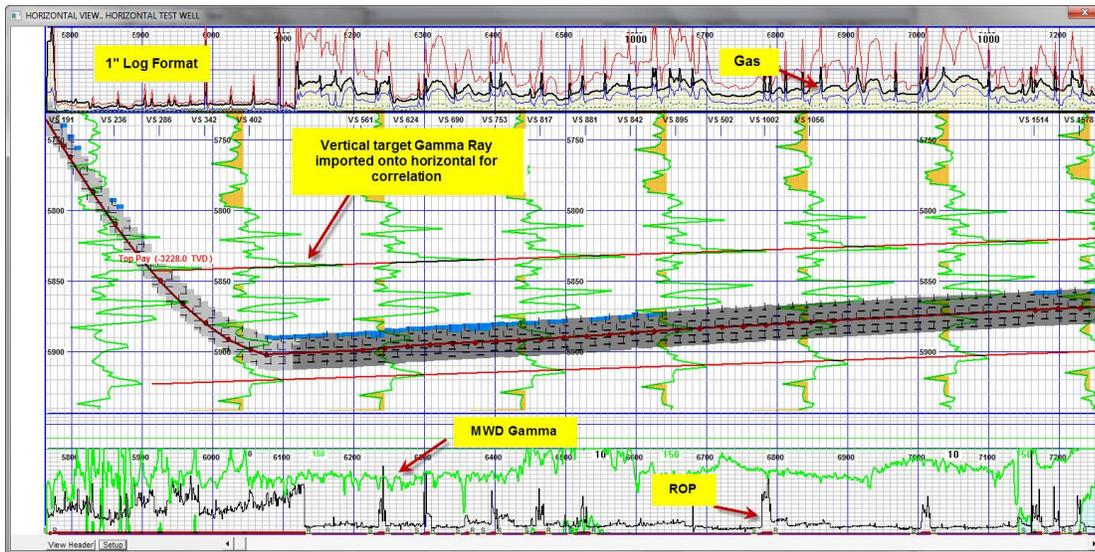
## Horizontal

The horizontal log is simply a different view of the data. The Quick View buttons on top of the log header will show the horizontal view when it is opened and can display the horizontal format in a 1”, 2” or 5-inch scale and with or without surveys. **The ability to view and access the horizontal will occur when 3 or more surveys have been entered with an inclination greater than 10 degrees.**

See **Plug Back for Horizontal or Sidetrack** if creating a new file from a vertical hole or in a sidetrack situation.

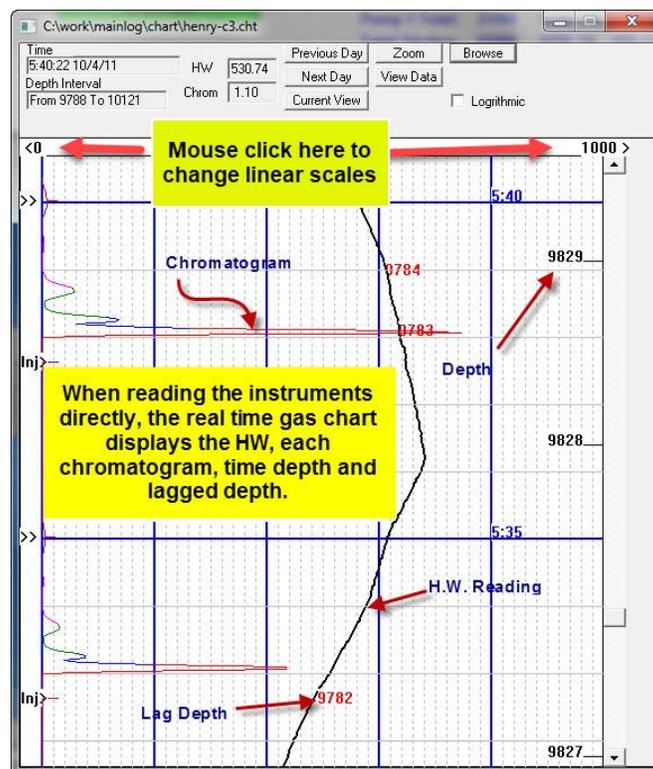
See **“Horizontal Options** in the **Setup** menu for additional information about the horizontal log.

**\*\*\*Note that the horizontal log cannot be displayed or accessed until 3 or more surveys have been entered with the inclination greater than 10 degrees.**



## Real Time Gas Chart

Displays a real-time gas chart which shows depth, hot wire gas, and chromatograms, if MainLog is reading directly from the instruments.

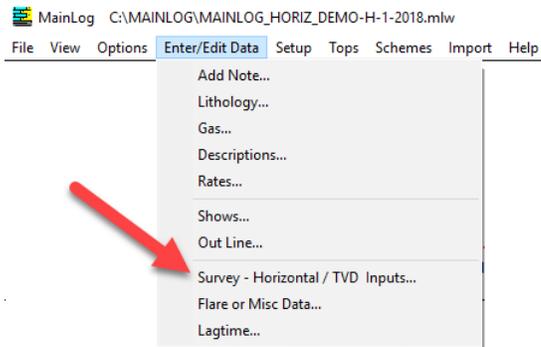


Scales can be changed from linear to logarithmic and **the chart can be annotated in the same way as “memo notes” are added to the mudlog.** The chart is time-based with a new chart file being created every 24 hours beginning at 12:01am; it is saved in the `c:\mainlog\chart \<filename@date.cht` folder. By clicking on the

browse button, you can view any previous charts stored in that folder.

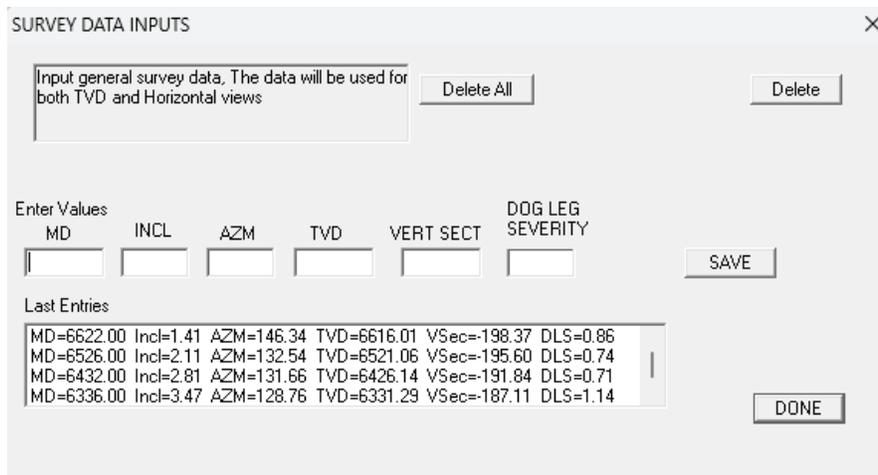
## View/Create TVD Log

To generate a TVD log, surveys are entered in the same dialog as entering surveys for a horizontal log, under **Enter/Edit Data...Survey – Horizontal / TVD Inputs**.



Once enough surveys are entered the TVD log can be generated and displayed by clicking the menu item, **View...View/Create TVD Log**. If there is no option to “**View/Create TVD Log**”, then not enough surveys were entered or if the difference between the MD and TVD is less than six feet.

If a TVD Log was not created while drilling, but surveys were entered for a horizontal log, it can be generated at the end of the well, including from the Office Program, by going to **View... View/Create TVD Log**.



MD	INCL	AZM	TVD	VERT SECT	DOG LEG SEVERITY
6622.00	1.41	146.34	6616.01	198.37	0.86
6526.00	2.11	132.54	6521.06	195.60	0.74
6432.00	2.81	131.66	6426.14	191.84	0.71
6336.00	3.47	128.76	6331.29	187.11	1.14

When creating a TVD log in the field and then generating a “ML\_” file to e-mail in, the TVD log will be included. Just to refresh, when the TVD is created, the

TVD filename will be the same as the MD file name except the first character in the filename is replaced with the tilde symbol. ( ~ )

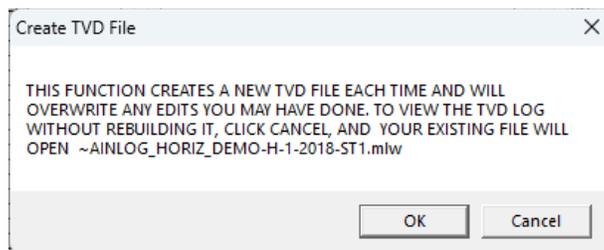
IE...If MD filename is **Star\_1H.mlw**, the TVD filename will be **~tar\_1H.mlw**. TVD files can be edited if there is a drilling key present, but they cannot be put into drilling mode. See **TVD Log Editing** below.

Please note that if gamma curve is present on a MD log and a TVD log is created, the gamma curve will be appropriately adjusted to a TVD gamma. This gamma may be useful to use as an Anchor Gamma on the horizontal log. Descriptions will also be included, however, some will be truncated or removed by the very nature of creating a TVD log.

## TVD LOG Editing

A TVD Log can be edited using Memo Descriptions and/or Memo Notes; however, it is highly recommended this be done at TD because when you click on “Create a TVD Log” and click “OK” from the popup dialog, MainLog **will create a new TVD log and overwrite any previous one that was viewed and/or edited.**

MainLog does give you the option to select “Cancel”, which prevents creating a new TVD log so that previous edits to the TVD Log are not overwritten. We strongly recommend that if you plan on adding notes or editing the TVD Log in any way, that you wait until the end of the well, so that your edits will not be overwritten. **\*\* Note once editing of the TVD is completed, we recommend you rename it by going to File...Change File Name.** i.e. ~tar\_1H.mlw to TVD Log Star\_1H.mlw. This way it cannot be accidentally overwritten.



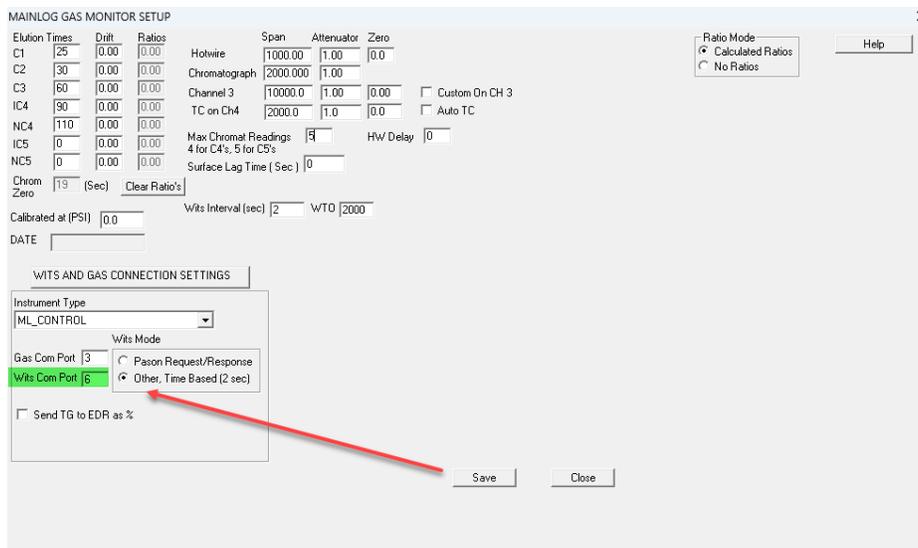
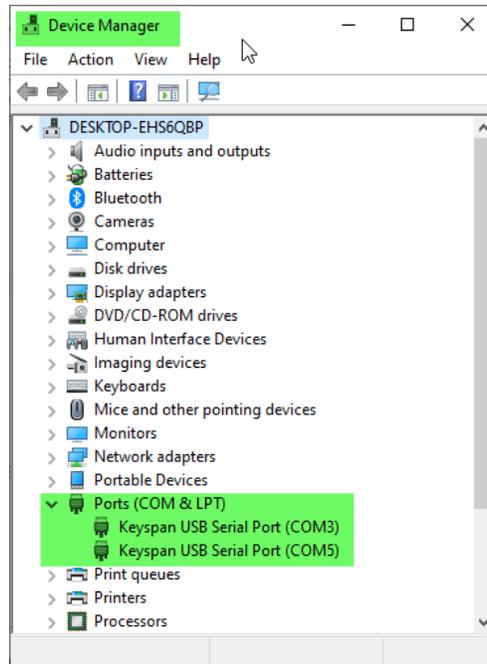
To “Edit the TVD Log” you must **right click on a memo description or memo note** to open the memo dialog; from here you can delete the memo, edit it, or create a new memo by clicking “New” and entering in a depth. You cannot click and drag a memo on the TVD log, but you can change the location from the memo dialog. This can be done on a 5”, 2” or 1” log.

You can also edit the log by selecting the **Enter/Edit Data** tab and select the

function you want to edit. (i.e. Lith, Descriptions, Rates, Shows, etc.)

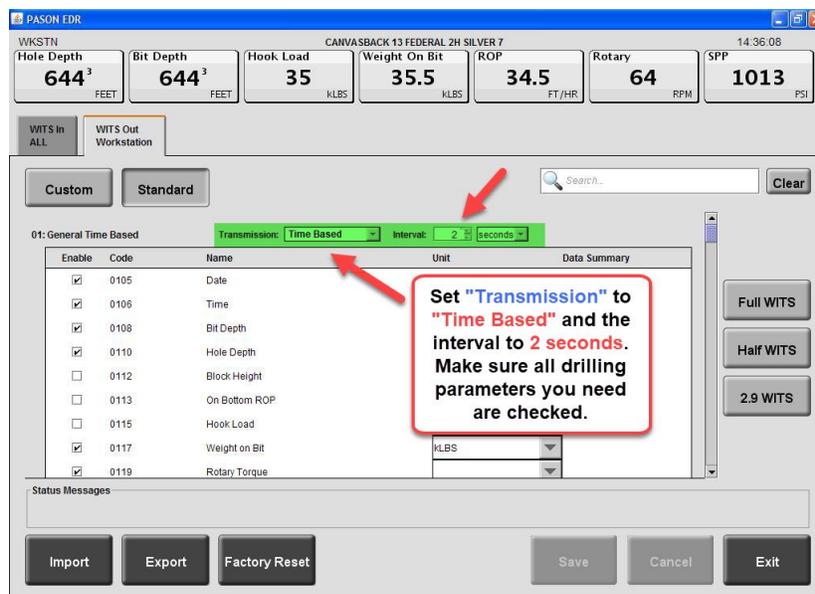
## WITS

The Communications Port, (Com Port) must first be known to turn on **WITS** and enter it in the **Setup/Gas Monitor Setup menu**. Go to **Control Panel\System\Device Manger** and see what com ports are available and change it in the Gas Monitor setup.



Check the appropriate box in the Gas Monitor Setup on whether it is **Pason Request/Response** or **Other, Time Based (2 sec)**. If the com port is not correct you will get an error message when trying open **View\WITS**; stating: “Connection to com < # > failed....” **Go to Control Panel\System\Device Manger** and see what com ports are available and change it in the Gas Monitor setup.

From the Pason Workstation determine if Pason’s “**Transmission**” is set to “**Request-Response**” or “**Time-Based**”. If it is set to “**Request/Response**” then “**Pason Request/Response**” should be checked in the **Gas Monitor Setup**. **If “Time-based” is selected on the Pason Workstation, then “Time Based (2 sec)” should be checked in the Gas Monitor Setup.** Also, if time-based is being used, set the interval to “2” seconds on the workstation. When drill rates exceed 150 ft/hr, Time Based is highly recommended.

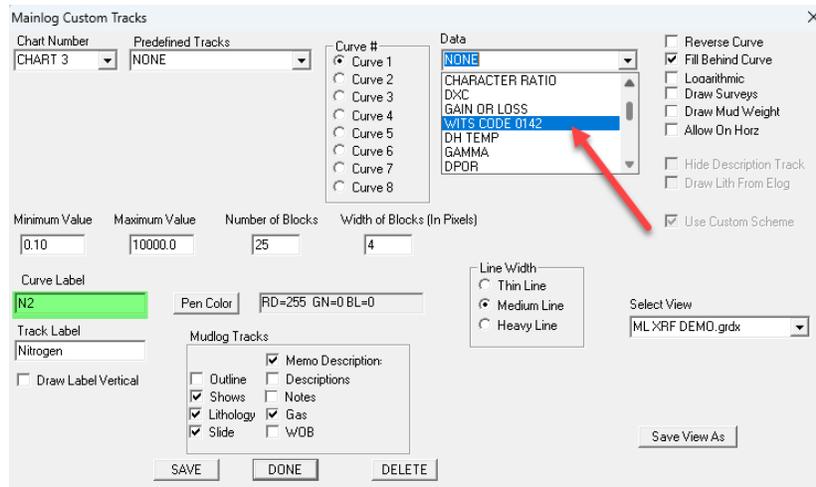


**NOTE:** If the EDR provider is Pason and the Wits data is being sent to the gas instrumentation first and then forwarded to MainLog, then “**Other**” needs to be selected in the Gas Monitor Setup. Instrument examples of this would be the Redbox, Terra SLS or the Bloodhound. Pason is only selected in the Gas Monitor Setup if the Wits feed is direct from the workstation to the PC and the Transmission is set to Request-Response on the Pason Workstation.

## WITS Code 142

**WITS Code 0142** is one of several spare WITS codes available from the EDR provider that can be used to receive data that you would not normally need. It requires you to contact the EDR provider and ask them to log into the EDR workstation and assign that code to a particular item (data) that you want to receive via WITS. That data can then be displayed on a custom track by selecting **WITS**

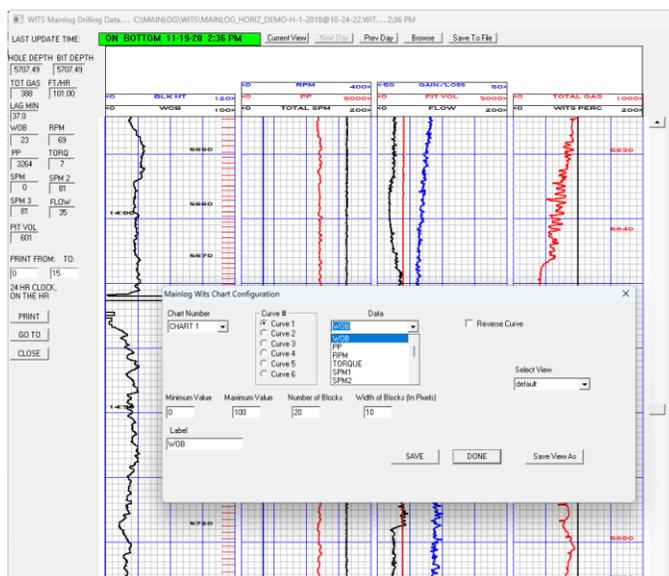
**Code 0142** under **Data** in the **Custom Tracks Dialog**. Label the curve appropriately and it will be listed in the LAS file under that name.



## WITS Chart

The **“WITS Chart”** is a **“time-based”** chart of incoming WITS data. Similar to an old Geograph Recorder display or current EDR Screen. A new Wits Chart is created at 12:00am every day, so data can be viewed by scrolling through the chart. Charts are saved daily, so by browsing, pervious charts can be selected and viewed. The chart includes ROP, WOB, Gas, WOB, Torque, Gain/Loss and more.

By right clicking on any of the charts a **“Chart Configuration”** menu will open where the logger can select what information he wants shown on the four charts available and up to six different curves per chart. Scaling and selecting the size of the grid is also available. The chart can also be printed out as a PDF.



## End of Well Report

By clicking on “**End of Well Report**” a text file is generated which contains Well Information, Dates (which include Number of days logging, Total days, Avg FT/day), Bit Records, Personnel, Drilling and Mudlog Data, Formation Tops, Show Intervals, and Surveys.

Being a text file, other items may be manually entered and although this is listed as an End of Well Report, it can be generated at any time, (i.e., daily) and give you first-hand information. It can even be saved and renamed as a daily report.

## \*E-Log Data as Text

E-Log Data as Text will only be seen if any E-log LAS data was imported to MainLog. This displays a dialog box with the data that was imported from the LAS file. The data is not editable. The dialog will update as you navigate through as the file. (Available in Office mode)

## Down Time Report

After clicking on “**Down Time Report**”, select a depth to create and insert a read only “**generic text file**” in **Word Pad** or **NotePad**, where one can enter text or copy and paste any information pertaining to the well. MainLog will name the file, [filename-DT@depth.txt](#), and will also add the date, depth, and time the report was created on the first line. The file will be in the **c:\mainlog** folder and will be sent in with the log when a “sendfile”, (.ml\_ file) is created.

The report can be useful for times when you are at the same depth for multiple days, such as, casing runs, fishing jobs, kick off points, and monitoring gas at TD to name a few. It can also be beneficial when there is not enough room in a memo to explain what may have occurred on the well. The one report can have multiple daily reports on it. At TD, you could easily copy and paste ALL downtime reports into one final report if appropriate.

Just as Morning Reports have the letter “R” on the log to access the reports, the abbreviation, “**DTR**”, will be placed in the gas column at the depth the Down Time Report was created. It can be accessed and edited when clicked on in both the Field and Office versions. To remove the DTR file, it will have to be done manually by going to the **c:\mainlog** folder by either deleting it or renaming it. Close MainLog first before deleting it.

## Options Menu

These options can be found under *Options* on the toolbar.

*Correct File Depth*

*Offset ROP*

*Gas as Percent of Total*

*Create LAS*

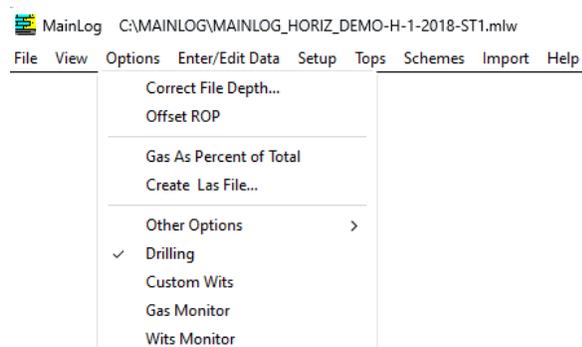
*Other Options*

*Drilling*

*Custom WITS*

*Gas Monitor*

*WITS Monitor*



### **Correct File Depth**

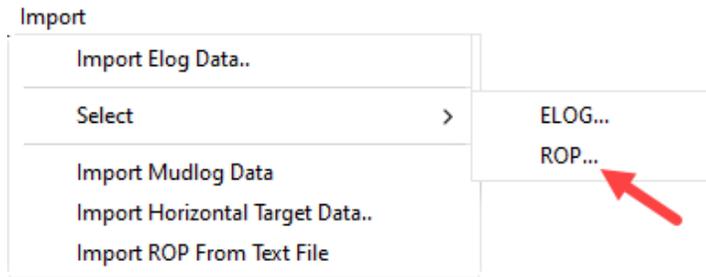
Enter the correct file depth to match the driller's depth. If a negative depth correction is made, MainLog will automatically backup the file at the depth the correction was made in the c:\mainlog\backup folder.

Note: if you only need to correct the depth to one-foot deeper, you can add a foot on the keyboard by hitting **Ctrl + f**.

### **\*Offset ROP (Also available in Office mode)**

Off set ROP from other MainLog log files can be imported and then be selected to be drawn in the ROP column with the current well.

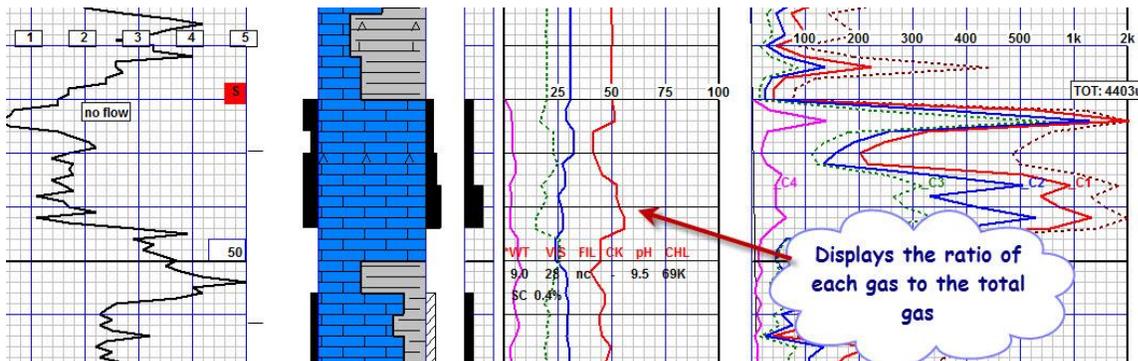
To import the ROP click on **Import\Select\ROP**.



Looking in the mainlog directory from the menu box that opened, click on the well name of the log whose ROP you want to correlate with and click open. Then go to **Options** and click on **ROP**. The offset ROP will now be on the log and can be “clicked and dragged” on, up or down, to correlate with the current well. At the bottom of the ROP column MainLog will display how high or low the current well is to the offset well.

**\*Gas as Percent of Total (Available in Office mode)**

This displays an additional grid over the description area of the log, which displays C1 through C5 as a percent of the total chromatograph gases. This is helpful in determining whether you may be in an oil, gas zone or water zone. This can also be displayed in **Custom Tracks**. (% of Gas Total)

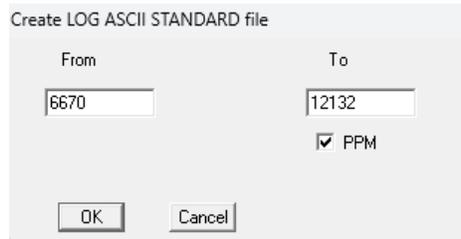


**\*Create LAS**

It prompts for an interval to create a LOG ASCII STANDARD file from the current log file. LAS Ver 3 which includes descriptions can be selected and the option to “Use Tab Delimiter” will also be available.

Also, if **gases are being displayed as “percent” on the log**, the option for the values in the LAS to be in PPM is available when creating the LAS. **LAS in PPM**

can also be selected in **Setup\Lines and Scales**, so when a **Sendfile** is created for e-mailing, gases in the LAS file in the **c:\mainlog\sendfile** folder will be in PPM. Including in the <filename.ml\_> file.



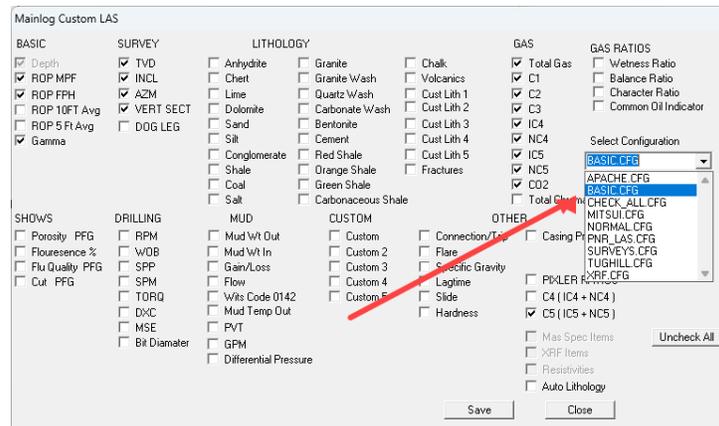
When “OK” is checked the file will be saved in the **c:\mainlog\mudloglas** folder as filename.las, where filename is the name of the file currently opened. The LAS does open in a text editor when OK is selected and can easily be saved to another folder as well. (From the text editor, choose File/Save As)

**Note:** You can open and view a LAS using any text editor, but we recommend using **Note Pad or Word Pad**. From the text editor, view it as “**NO WRAP**”.

A **Custom LAS** can be created by going to **Setup\Lines and Scales** and clicking on the “**Configure LAS Dialog**” button. A Custom LAS can be named and saved. See **Configure LAS File**.

Per client request MainLog has added two specific LAS formats for Oil & Gas Operators, Apache, and Pioneer (PNR)\*\*. If Pioneer is in the MainLog header, MainLog will create a LAS file per their requirements. \*\*Also, there is a PNR view setup that must be selected in the Custom Tracks Dialog to ensure that the LAS file is correctly created.

If an Apache LAS is required, it can be selected from the “**Select Configuration**” button in the **Custom LAS** dialog.



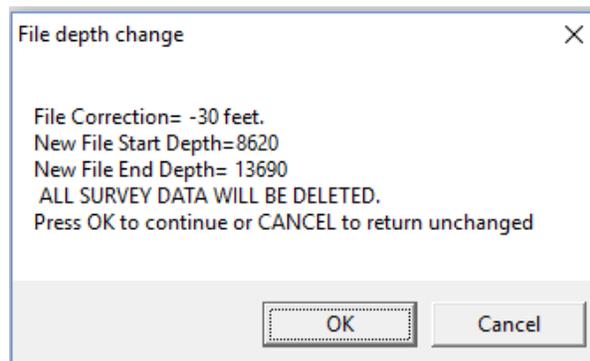
**\*Other Options (Some are available in Office mode)**

**Check File Depth**.... This is where MainLog will check to see if there are any depth errors in the file and make corrections if necessary.

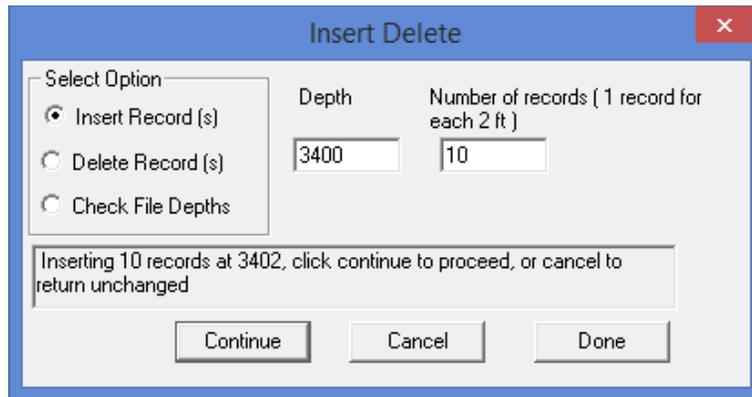
**\*Adjust File Depth ... (Also, available in Office mode)** This feature adjusts the whole file up or down by the number of feet you specify, **however, it is not intended and should not be used for adjusting depths at Kelly down.**

**\*\*This is only available when in office mode and should not be used to make depth corrections except for certain situations.** For instance, to synchronize the mudlog file depth the E-log depth. Adjustments can be positive (deeper) or negative (shallower). Major depth corrections may be a situation where you would use this feature. One such example may be if the rig strapped out of the hole and made a depth correction because they left out or added a joint or two. **It is highly recommended you consult with the company geologist and your office before proceeding with this.**

**Note: If survey's have been entered and the file is adjusted more than four (4) feet they will all be deleted. There will be an option to cancel the adjustment before deleting them. The MWD company should have corrected surveys and they will have to either be manually re-entered or imported from a LAS file. When uncertain what to do, please contact us before adjusting the file.**



**Insert Delete Records**...Records can be inserted or deleted from the log. **Before doing so consult with your office and make a backup copy of the log before doing so.** You can also “Check File Depths” here. This is where MainLog will check to see if there are any depth errors in the file and make corrections if necessary.



To insert or delete records, enter in the depth required and then enter in the number of records to be inserted or deleted. 1-record = 2 feet; i.e. 50 records would be 100 feet. After entering the number of records make sure and hit “Enter” on the keyboard. After hitting Enter, a message will show how many records are being deleted or inserted and the depth they are doing that from.

Click “Continue” after verifying the message, and then “Done” to close the dialog. Close MainLog and reopen before going back to drilling mode.

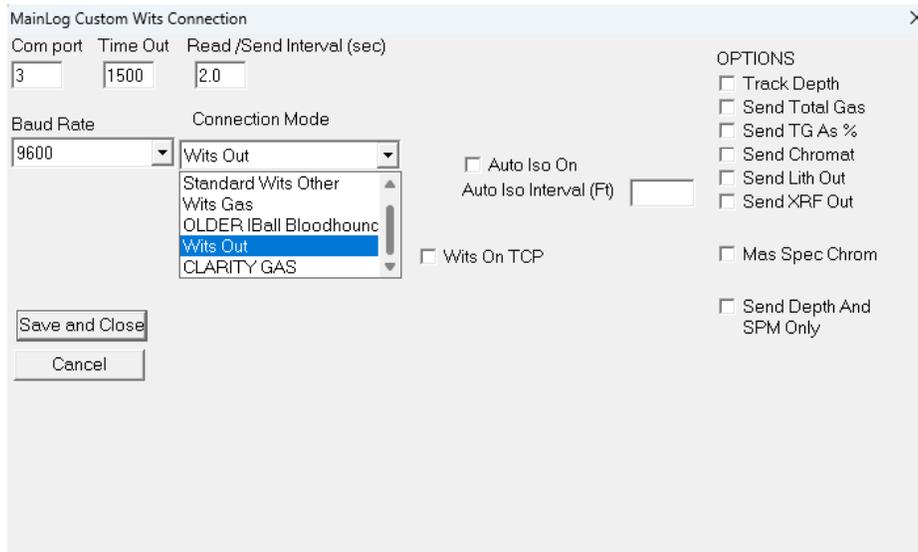
**\*Append File Depth...** (Available in Office mode only) This allows you to make the file deeper than actual logged depth. This is useful when importing offset e-logs curves to correlate further down the hole while drilling. Zero’s out data through the new interval. This cannot be used to truncate file in office mode.

## Drilling

This puts you into drilling mode. (Data acquisition & plotting) If there is no hardware key plugged in, you will not have this option.

## Custom WITS

A second Custom WITS feed can be set up in addition to the standard WITS connection being used. Depending on the situation various Connection Modes and Options can be made. See **Setup Custom WITS Feed**



## Gas Monitor

Mainlog Wits Gas Monitor									
TG	C1	C2	C3	IC4	Nc4	IC5	Nc5	C02	Run
402	347	231	115	57	34	0	0	1.74	1
787	0.44	0.29	0.15	0.07	0.04	0.00	0.00	7	

Turns on the Gas Monitor display so that gas can be read and plotted either directly from instruments or from a WITS feed. You must make sure you are on the correct Com Port; select this in **Setup\Gas Monitor and Wits Setup**.

## WITS Monitor

Turns on (or off) the WITS monitor. If the WITS dialog does not open or does not update, you may have selected the wrong com port. Go to **Setup\Gas Monitor Setup** and verify the com port is correct.

MAINLOG WITS MONITOR RUNNING ON COM 8									
DEPTH	BIT DEPTH	WOB	RPM	TORQUE	PP	SPM	SPM2	SPM 3	
8837.98	8837.98	30	60	1838	2000	80	98	80	
FLOW	PIT VOL	GAIN / LOSS	RTG	AT	PERCENT	BYTES IN	BYTES OUT		
20	40		155	8837.98	100.0	6000	310		

If the com port is in use, or does not exist, you will get an error message when trying open stating: **“Connection to com <#> failed....”**, or **“Port may be in use by another process”**, **Go to Control Panel\System\ Device Manager** and see what com ports are available and change it in the Gas Monitor setup. If the Dialog opens, but there is no data, you selected the wrong port, or there is a problem with the WITS feed coming in.

Also, verify the WITS mode is set correctly to **Pason Request Response** or **Time Based (2 sec)**. If you have selected **Older Bloodhound Wits (115000) Instrument Type**, MainLog will automatically set the WITS mode to **iBall**. If the Instrument Type is set to **Terra SLS** MainLog will automatically set the WITS mode to **Time Based (2 sec)**. If the Instrument Type is set to **WITS or New Bloodhound** and a **New Bloodhound is being used**, the logger must **manually set the WITS Mode Time Based (2 sec)**.

**Note:** Start fresh and reboot the computer before calling the office.

## **Enter/Edit Data**

These options can be found under **Enter Data** on the toolbar.

*Lithology*  
*Gas/Mud/Custom Items*  
*Descriptions*  
*ROP Rates*  
*Shows*  
*Out-Line*  
*Survey – Horizontal / TVD Inputs*  
*Flare Data*  
*Lagtime*

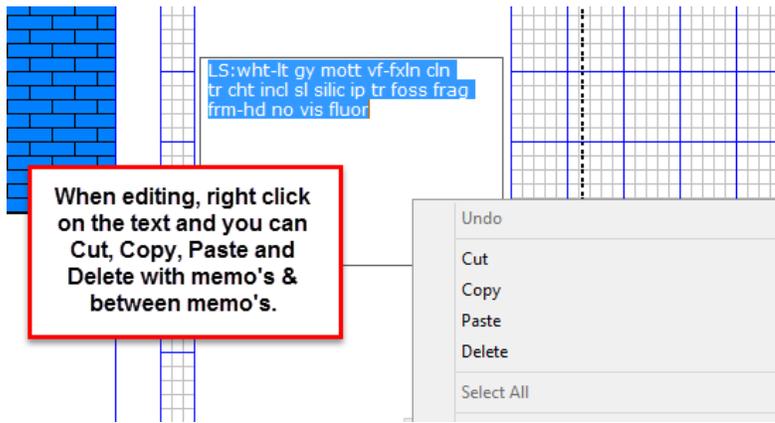
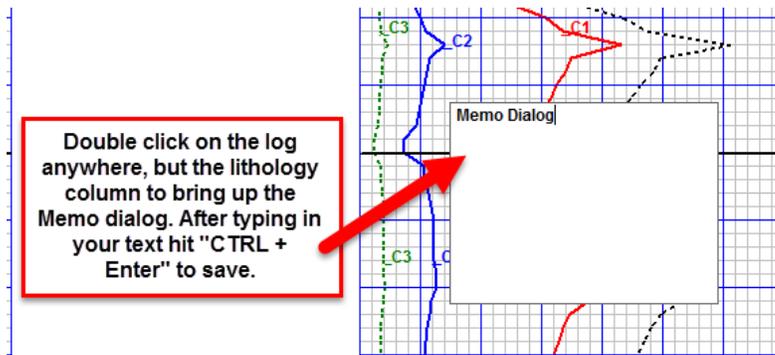
In drilling mode, double clicking in the appropriate area of the log will bring up the entry dialog for that data set. Either **Double Clicking or Ctrl + double clicking** (if using Memo Descriptions), in the gas grid will open the gas entry dialog with the appropriate start depth or the ROP edit dialog when in the ROP column. If you have not entered gas yet, you will be prompted for a start depth the first time. The same applies to all entry functions except rates and shows, which will always prompt for a start depth.

## **Memo's**

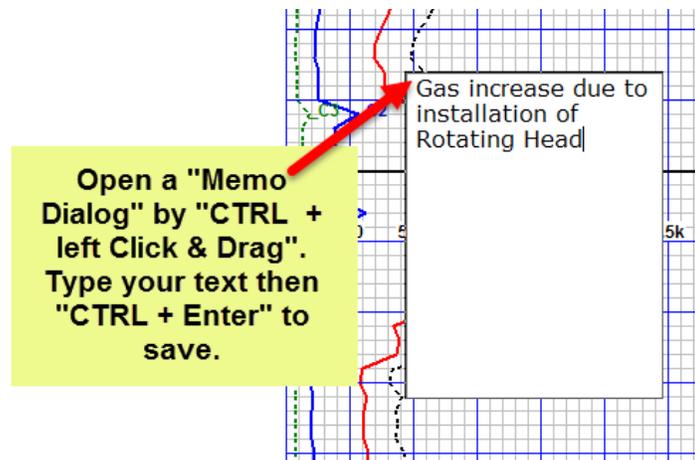
To use Memo's, **they must be turned on in Scheme's**. Go to **Schemes\Edit** and check **"Memo Notes"**. Click "Save", then "Close".

There are **two ways** to create "Memos" on the vertical log. First is by **a left double click anywhere on the log, except the lithology column**, and a memo dialog will

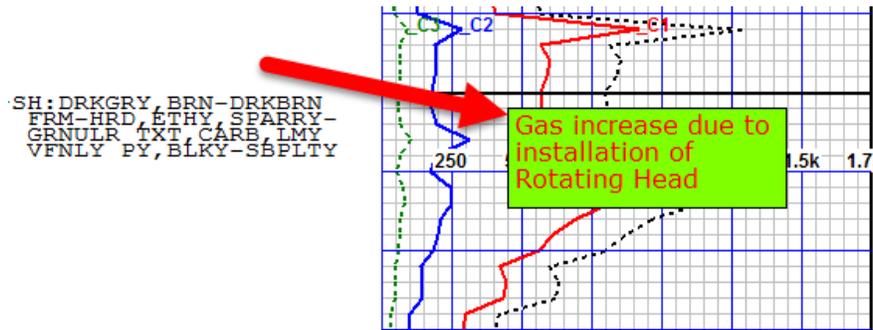
open. Type the text and hit **“CTRL + Enter”** to save it. MainLog will automatically size the box to the text.



The second way to create a memo on the vertical log is **“CTRL+ left click & drag”**, down and to the right on the log. You can size the dialog by the direction of how far you click & drag, then type in your text and **“Ctrl + Enter”** to save. Each memo is limited to 500 characters on the Vertical log and the Horizontal Log.

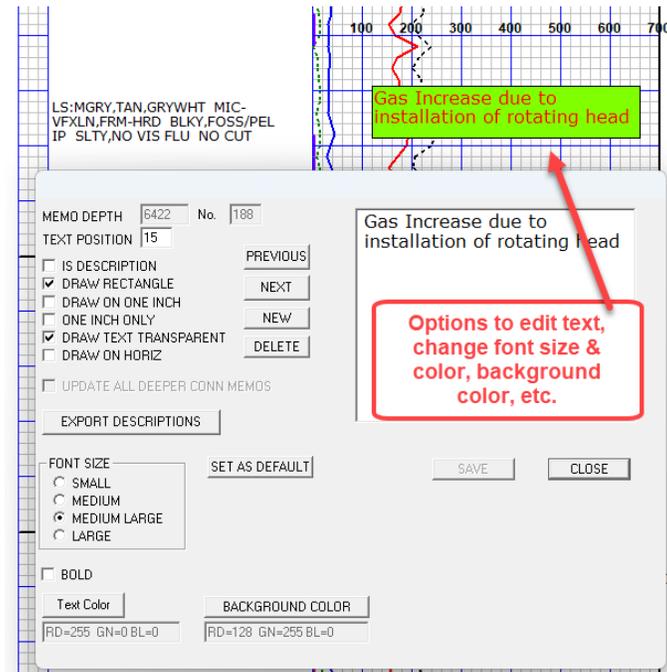


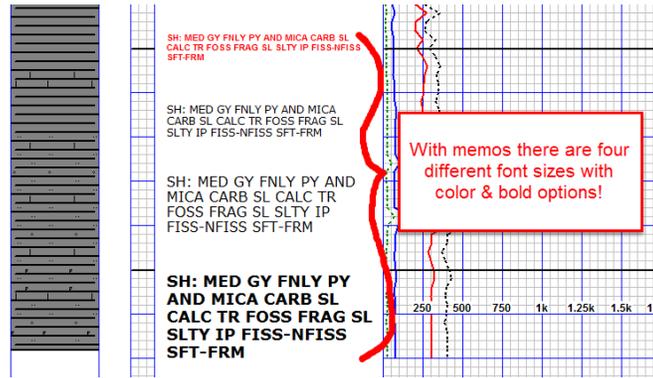
“**Ctrl + Enter**” saves the memo and MainLog will automatically re-size the dialog box to fit the amount of text. What used to take multi-line notes to describe an event can now be done in one dialog.



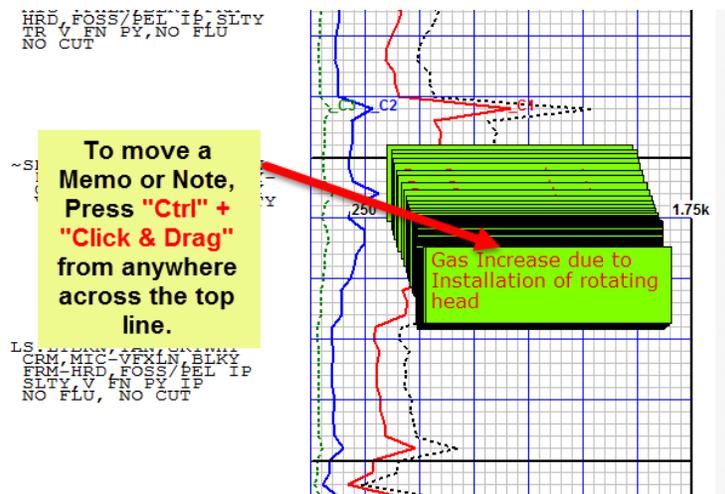
By **right clicking on the memo** an Edit dialog opens which includes changing the font size, color, background color, draw a rectangle around it and more including the ability to save your settings as “Defaults”. **You can copy & paste too & from memos.**

As in Short Reports you can click “New” and type in the depth and create new memo at the new depth or check “Delete” and remove the memo.

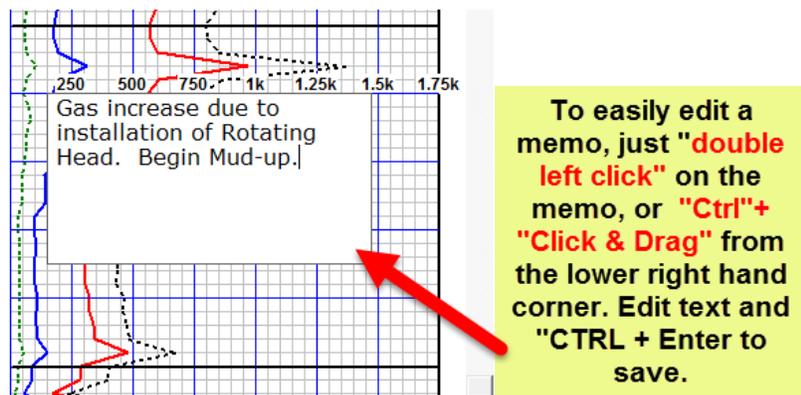




Memos and Notes can be moved by pressing “Ctrl”, then click and drag from anywhere across the upper top line of the memo or note.



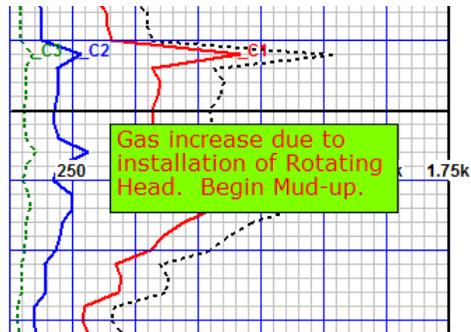
Memos can easily be edited by just left clicking on the memo or by “Ctrl” + left click & dragging from the bottom right corner. Delete or add text and “Ctrl + Enter” to save. If before saving you hit the “Esc” key, or just click outside the memo, the memo will return to the way it was.



```

~SH:DRKGRY, BRN-DRKBRN
FRM-HRD, ETHY, SPARRY-
GRNULR TXT, CARB, LMY
VFNLV PY, BLKY-SBPLTY

```



```

LS:LTBRN TAN GRYWHT

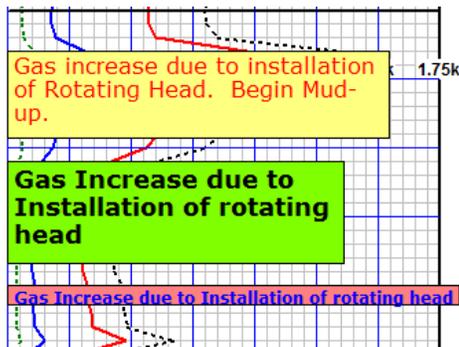
```

**\*\*By “Ctrl” + left click and dragging from the lower right-hand corner you can also re-size the memo to what you require and “Ctrl” + Enter” to save.**

```

~SH:DRKGRY, BRN-DRKBRN
FRM-HRD, ETHY, SPARRY-
GRNULR TXT, CARB, LMY
VFNLV PY, BLKY-SBPLTY

```



```

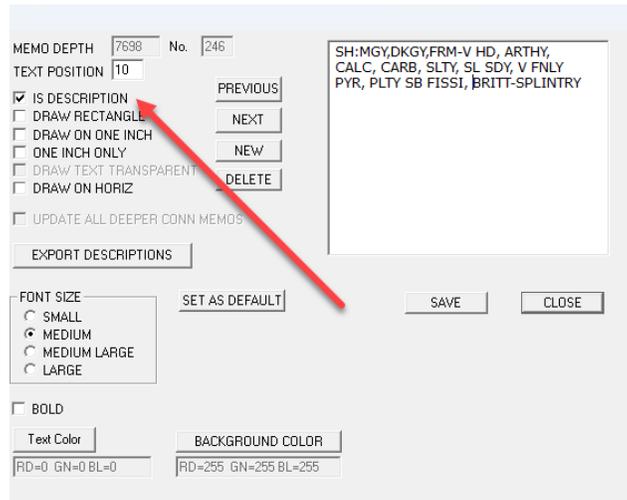
LS:LTBRN, TAN, GRYWHT
CRM, MIC-VFXLN, BLKY
FRM-HRD, FOSS/PEL IP
SLTY V FN PY IP
NO FLU, NO CUT

```

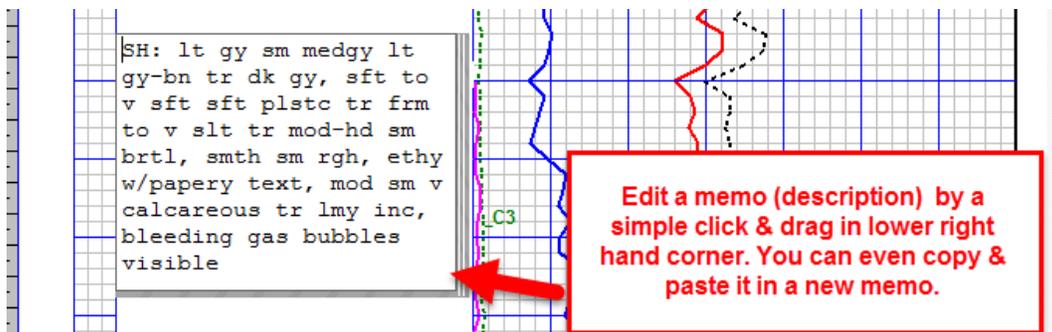
## [Memos as Descriptions or Descriptions as Memos](#)

Memos can be used as descriptions by selecting it in the Memo edit dialog. (Right click on the memo to open the dialog) Choose the font size, color, background color, case type and save it as a **“Default”** if desired.

Also in the dialog the **Export Descriptions** tab will export all descriptions into a text document by the depth they were created.



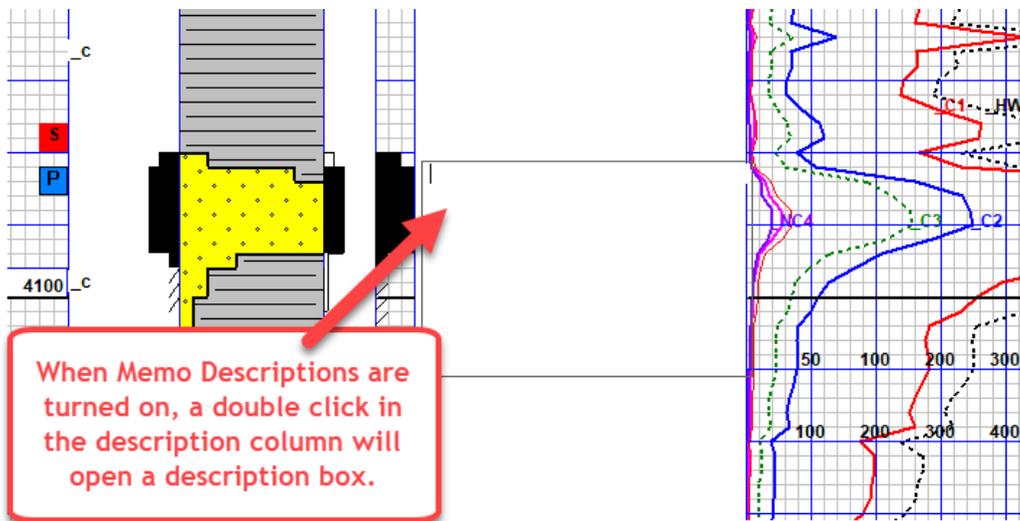
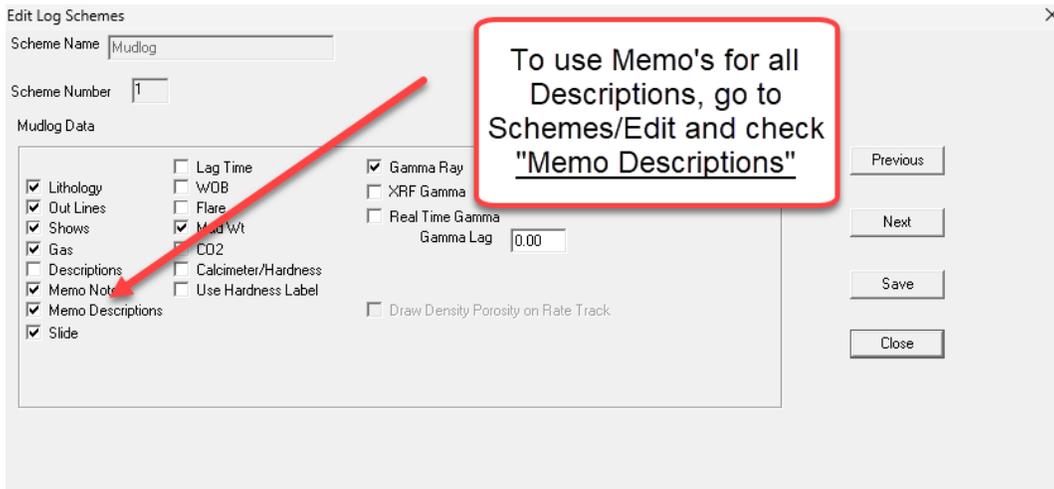
MainLog will automatically place it in the description column. From there it can be dragged up or down only or easily opened for editing or right click on it to get the Memo Edit dialog to change font size & color.



**Right click on the memo** opens the dialog where you can check “New” and type in a new depth to create and edit a new Memo at the depth entered.

### [All Descriptions as Memos](#)

To use Memos as the default for Descriptions go to **Schemes** and under “Mudlog Data” “**Memo Descriptions**”. When you double click in the description column a memo dialog box opens and you can type in your description. With this setting the old method of doing descriptions is disabled.

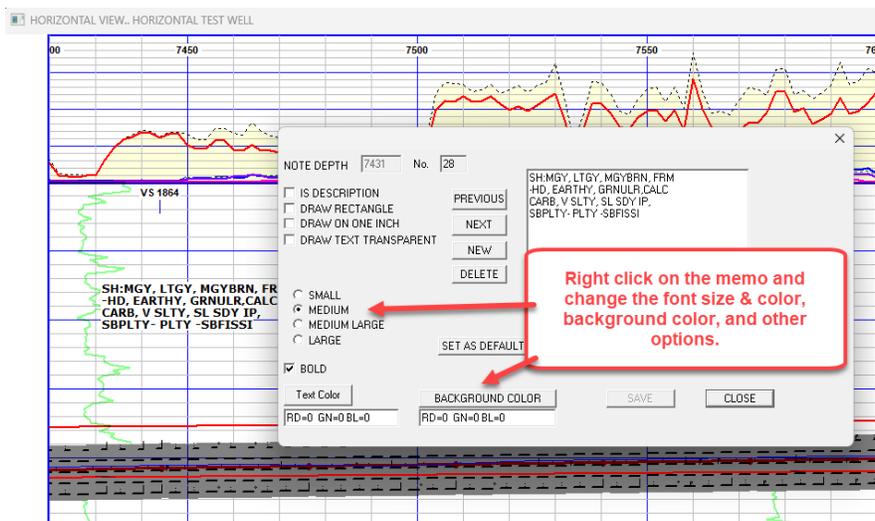
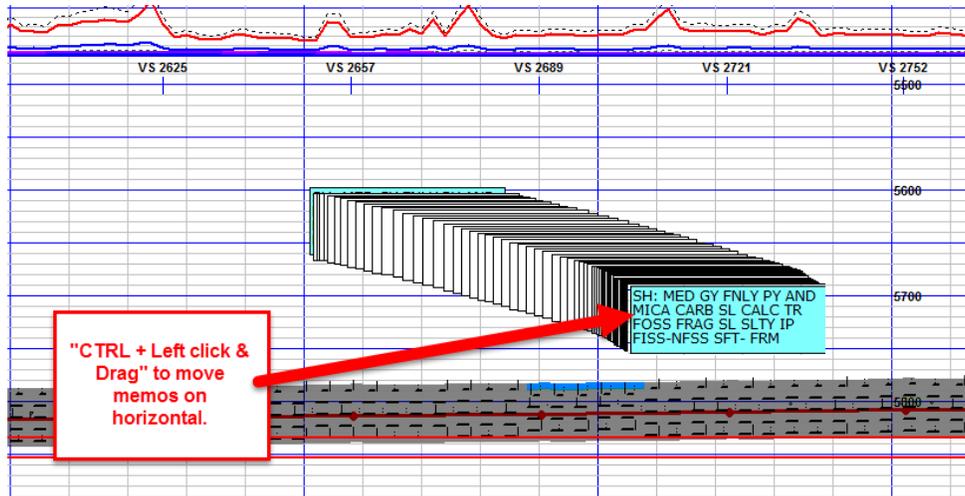


## [Descriptions & Memo's on Horizontal](#)

When using “memos as descriptions” you may select “**Draw on Horiz**” from the Memo Edit dialog for the description to be displayed on the horizontal log or use the “~” (tilde) as the first character of a description which will cause that description to be displayed on the horizontal at the same depth.

**It is important to note that when a description, memo or short report is assigned to the Horizontal Log from the “Vertical Log” it becomes a “Horizontal Memo” on the horizontal log. The editing of that Horizontal Memo is then done from the Horizontal Log view.**

**\*\*\*Any memo can be displayed on the horizontal log.** Once on the horizontal, use **“CTRL + left click & drag”** to move memos.



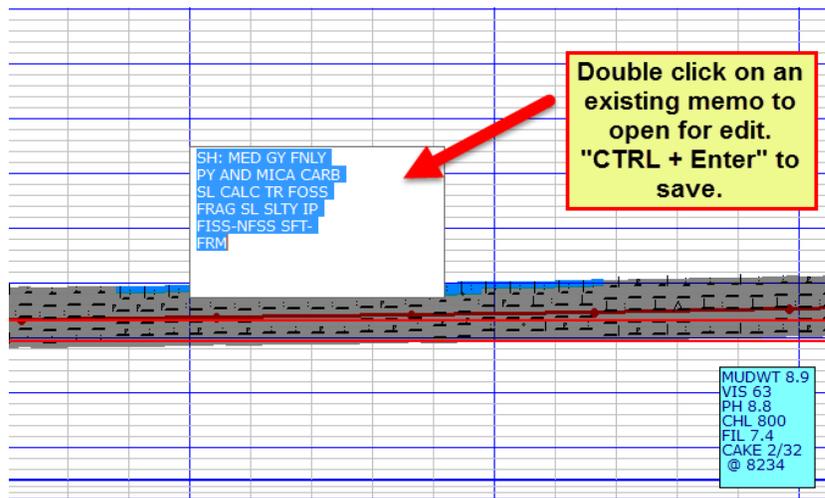
Being memos, they can be re-sized by **“Ctrl + left click & drag”** from the lower right-hand corner. **“CTRL + Enter”** to save.



**Left "double click" on the horizontal to open a memo dialog.**



**Left double click on an existing memo to open for editing. Use "CTRL + Enter" to save.**



## Lithology

To enter lithology, you can do it one of two ways. Under the *Enter Data* menu on the toolbar, you can select the menu item *Lithology....*, which will prompt you to enter a depth. Enter the depth and either press <enter> or you can click <OK> with the mouse. An easier way is to “left” double click in the lithology column at the depth you want to enter lithology.

Enter each percent and lithology abbreviation separated by commas or periods, with no spaces between the percent and the lithology. ie... **80ls,20sh is correct**, (No Spaces), 80 ls,20sh will not work. To add an accessory, add the number for the accessory to the percent. ie ...to make 100% dolo cherty, enter **105dolo**, or to make 80% Cherty Lime and 20% Sandy Shale...**85l,22sh**.

After typing in the percentages and lithology, press the “Enter key” and the lithology will be drawn on the log in that two-foot interval. Keep hitting “enter” and it will continue that same lithology on the log until you stop and enter a new percent and lithology in. Once you are finished, click the <Done> button with your mouse.

All abbreviations and accessories are under the <Help> button.

Enter Lithology

Enter lith for 12592 to 12594

80L,22SH

Done Cancel Help

Click on "Help" to view Lith Abbreviations and Instructions

Lithology Help

Lith	Min. Abbrv.	As Acc
LIMESTONE	L	4
CHERT	CH	5
DOLOMITE	D	1
SAND	SS,SD	2
SILT	SL,SI	6
SHALE	SH	8
ANHYDRITE	A	3
COAL	CO	9
PYRITE	N/A	7
SALT	SA	N/A
DOL'C LIME	DL	N/A
DOL'C DOL	DD	N/A
GLAUC LIME	GL	N/A
GLAUC DOL	GD	N/A
BENTONITE	BE	N/A
GRANITE	GR	N/A
CONGLOMERATE	CG	N/A
GLAUC SAND	GS	N/A
FOS'F LIME	FL	N/A
FOS'F DOL	FD	N/A
CARB SH	CS	N/A
GRANITE WASH	GW	N/A
QUARTZ WASH	QW	N/A
CARBONATE WASH	CW	N/A
CEMENT	CM	N/A
RED SHALE	RSH	N/A
ORG SHALE	OSH	N/A
GREEN SHALE	GSH	N/A
CHALK	CK	N/A
VOLCANICS	VDL	N/A
CUST LITH 1	C1	N/A
CUST LITH 2	C2	N/A
CUST LITH 3	C3	N/A
CUST LITH 4	C4	N/A
CUST LITH 5	C5	N/A
CUST LITH 6	C6	N/A
BLANK (NO LITH)	BL	N/A

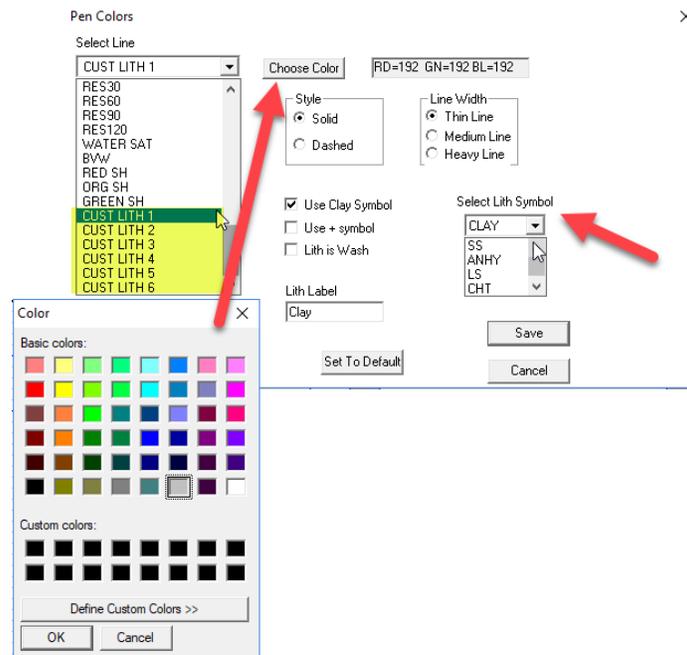
ENTER EACH PERCENT AND LITHOLOGY SEPARATED BY COMMAS, WITH NO SPACES BETWEEN THE PERCENT AND THE LITHOLOGY. IE.. 80LS,20SH IS CORRECT, 80 LS,20SH WILL NOT WORK. TO ADD AN ACCESSORY, ADD THE NUMBER FOR THE ACCESSORY TO THE PERCENT. IE ..TO MAKE 100% DOLO CHERTY, ENTER 105DOLD, OR TO MAKE 100% LIME SHALV, ENTER 108LS.

YOU CAN USE THE ARROW KEYS TO MOVE UP AND DOWN THRU THE INTERVAL TO MAKE CHANGES. NOTHING IS CHANGED UNTIL YOU PRESS ENTER. PRESSING ENTER WITHOUT ENTERING A NEW READING WILL COPY THE PREVIOUS READING (AFTER THE FIRST VALUES HAVE BEEN ENTERED) WHEN DONE CLICK ON THE DONE BOTTOM TO SAVE THE NEW VALUES, OR CANCEL TO LEAVE THE FILE UNCHANGED ANY LITH ENTERED WITH A "-" AS THE FIRST CHARACTER (50'L,50'SH) OF THE ABBREVIATION WILL SHOW FRACTURES. (A RED DIAMOND SHAPE SYMBOL) ENTER 100BL TO ERASE.CUST SHALE COLORS DEFAULT TO LIGHT GRAY, AND MUST BE SET IN SETUP...LOG COLORS

Under “**Help**”, all the lithology abbreviations, accessory numbers, and instructions of how to enter lithology can be viewed.

Whether you enter a start depth or double click in the lithology column to start entering data you can scroll down using the arrow keys to go to a different depth to enter or edit lithology. You can scroll back up with the arrow keys, but only to the depth that was originally entered. Some logging companies have a “sand shale only” feature. If you have this feature, simply enter the percentage of shale, and the balance of 100% will be entered as sand.

**Custom Lithology** is also available. Go to “**Setup/Log and Lithology Colors**”, click on <**Select Line**> and scroll down to view “**Custom 1 through Custom 6**”. Choose one of the six custom “**LITH**” numbers. Next select the color and then one of the Lith Symbols. You can also add the clay, plus or Lith as Wash symbols as accessories to the custom lithology.

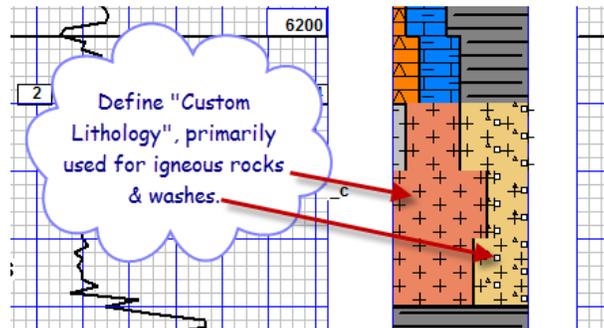
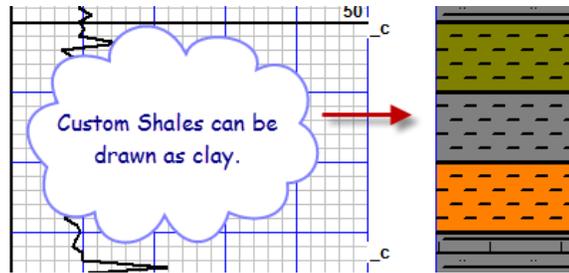


By filing in the “**Lith Label**” it will be added to the mudlog Header and added to the LAS file.

From the “**Enter Lithology**” menu click on the “**Help**” tab to view the codes for entering in the custom shale color that was chosen.

Lith	Min. Abbrv.	As Acc
LIMESTONE	L	4
CHERT	CH	5
DOLOMITE	D	1
SAND	SS,SD	2
SILT	SL,SI	6
SHALE	SH	8
ANHYDRITE	A	3
COAL	CO	9
PYRITE	N/A	7
SALT	SA	N/A
OO'L'C LIME	OL	N/A
OO'L'C DOL	OD	N/A
GLUAC LIME	GL	N/A
GLAUC DOL	GD	N/A
BENTONITE	BE	N/A
GRANITE	GR	N/A
CONGLOMERATE	CG	N/A
GLAUC SAND	GS	N/A
FOS'F LIME	FL	N/A
FOS'F DOL	FD	N/A
CARB SH	CS	N/A
GRANITE WASH	GW	N/A
QUARTZ WASH	QW	N/A
CARBONATE WASH	CW	N/A
CEMENT	CH	N/A
RED SHALE	RSH	N/A
ORG SHALE	OSH	N/A
GREEN SHALE	GSH	N/A
CUST 1 SHALE/CLAY	C1	N/A
CUST 2 SHALE/CLAY	C2	N/A
CUST 3 SHALE/CLAY	C3	N/A
CUST 4 SHALE/CLAY	C4	N/A
CUST 5 SHALE/CLAY	C5	N/A
CUST 6 SHALE/CLAY	C6	N/A
BLANK (NO LITH)	BL	N/A

ENTER EACH PERCENT AND LITHOLOGY SEPARATED BY



## Gas | Mud | Custom Items

To enter gas, look under the *Enter Data* menu on the toolbar and select **Gas....** it will prompt you to enter a depth. Enter the depth you want to start logging gas and press **<Enter>** or click **<OK>** to continue. You can also double click in the gas column and it will start you at the depth you last entered gas. **\*\* If you are using "Memos" you will need to press "Ctrl + Left Click" to open the "Enter Gas" or**

## “Enter Rates” dialog.

In the Enter Gas Dialog there are options for *Max gas entries, ratios (in some cases), CO2, Mud Wt In, Mud Wt Out, Custom Data and Custom Data 2 through 5.*

The screenshot shows the 'Enter Gas' dialog box. The title bar reads 'Enter Gas'. The main text area contains 'Enter gas for 10510'. Below this is a 'HW' label and a spin box with the value '5', followed by the text 'Max Entries'. A data entry row displays the values '2259 1602 619 25 12 0 0 0'. Below the data row are several checkboxes: 'Use Ratios', 'Custom Data', 'Custom Data 2', 'Custom Data 3', 'Custom Data 4', 'Custom Data 5', 'Mud Wt In', 'Mud Wt Out', and 'CO2'. At the bottom are 'Done' and 'Cancel' buttons.

**Max Entries:** Set this value to the number of gases you want to enter. For example, if you are logging HW, C1, C2, C3, IC4 and NC4, set it to read 6 max entries.

**Ratios (in some cases):** If you choose to, you can log gas by ratios. It will take the last gas readings (**IF GREATER THAN ZERO**) and use them to calculate the ratios. To use ratios, check the box next to **Ratios**. Enter the HW reading for the appropriate depth and it will calculate the rest of your gas readings for you.

### ++ **Feature:**

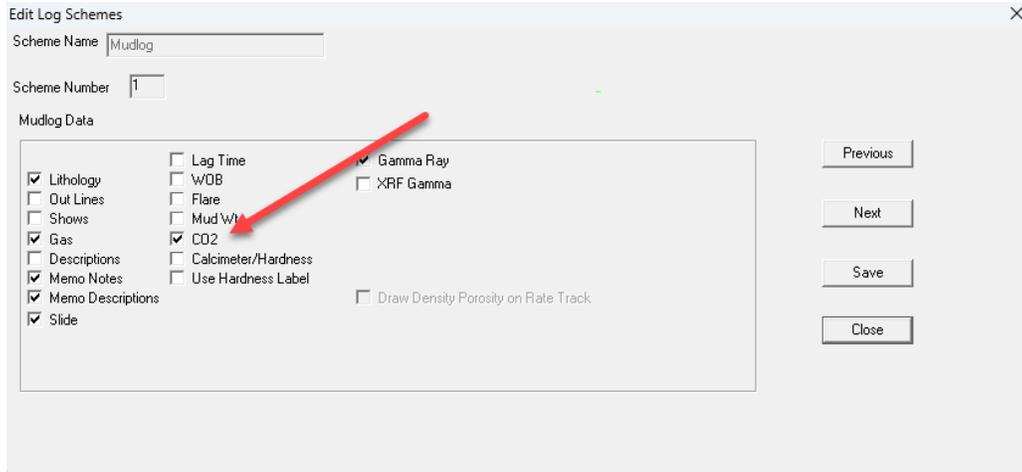
When you press the ‘+’ key, the entry depth increases by two feet, but no readings are entered. If you press the key 5 times, the entry depth displayed will now be 10 feet deeper than your last entry. Now enter the values for that depth, and the change will be averaged over the 10-foot interval.

**\*\*\*Please note that “Custom Data, CO2 and Mud Wt, (if on in Schemes) can also be edited when in the gas editing mode.**

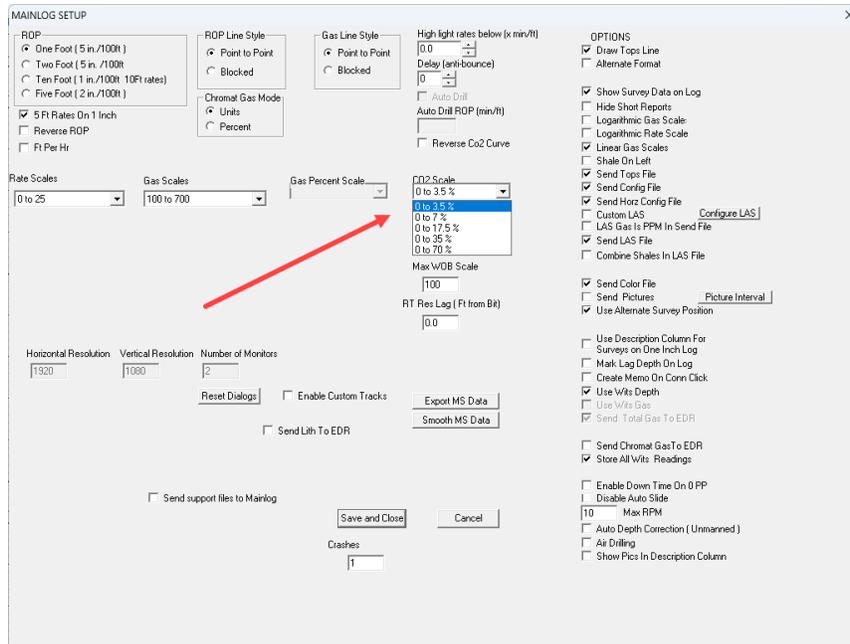
**CO2:** CO2 can be read via WITS or Imported and plotted on the log. It can be sent out on Wits by checking the box “Send Chromat Gas to EDR” in Setup\Lines and Scales.

To see CO2, it must be turned on in the **“Schemes Menu”**. Click on

**Schemes\Edit** and in the “Mudlog” scheme check the CO2 box under “Mudlog Data” and click “Save”. **If you are using a standalone CO2 detector, see CO2 Detector .**

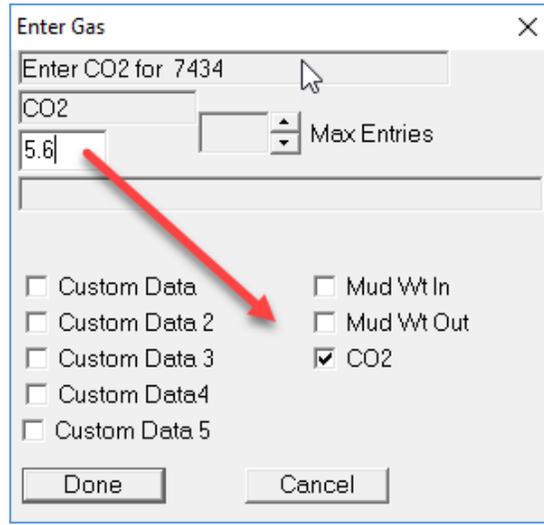


Once this is done a CO2 scale in percent will be seen in the gas column. Under **SetupLines & Scales** the CO2 scale can be changed and “reversed” if the hydrocarbon gas scales are linear. As another option, CO2 can also be selected to be on a Custom Track. See **Custom Tracks**.



CO2 can also be edited, just double click in the gas column, check the CO2 box and enter in the correct values. Note: if the CO2 curve is in the **Custom Tracks**

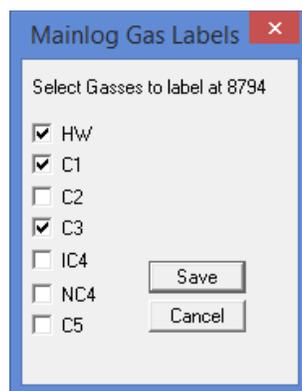
column, it can also be edited this way. If you decide to have CO2 on a Custom Track, just go to **Schemes\Edit** and uncheck it under Mudlog Data. This way it won't be in the gas column.



**Mud Weight (Mud Wt):** Mud Weight can be edited and entered in by checking the “Mud Wt In or Mud Wt Out” box. MainLog when using the mud weight in certain calculations, such as D-Exponent, will use these values at the depths they are entered.

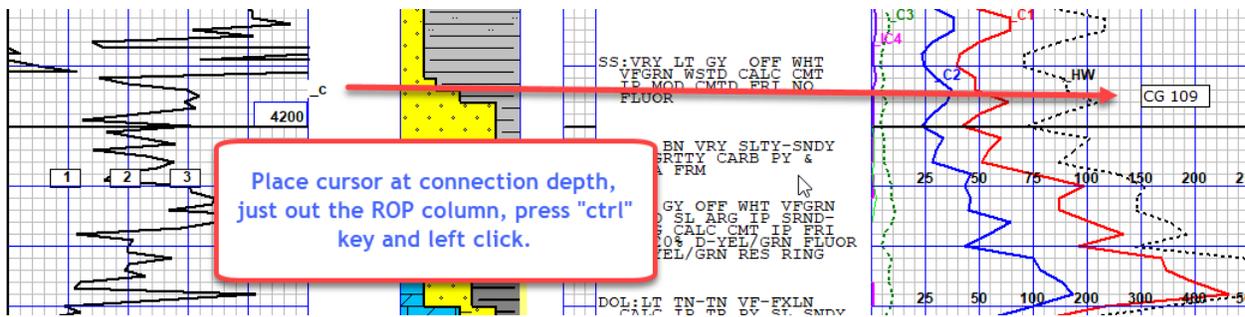
**Custom Data through Custom Data 5:** If any gas or data curves were imported to a custom track they can be edited from the “Enter Gas” menu by checking the appropriate box.

**Labeling Gases:** With the control key down, right click in the gas grid at the depth you want the labels to be. A dialog will come up, allowing you to check the gases that you want labeled. To remove labels, do the same thing and remove the checks.



**Connections:** To add a connection indicator to the log, without using a note, place your cursor within one block width to the right of the last ROP grid block. Hold down the control key and press the left mouse button. This will place a “\_c”, at that position. (Note some clients have “KD” placed there) If you click in the upper half of the block, the “\_” will be centered on the block. If you place your click in the lower half, the “\_” will align with the lower grid block line. Pressing the right button will put in or remove a casing point symbol.

Another option when inserting a connection is to have the connection gas value automatically displayed as a memo note in the gas column. Go to **Setup\Lines and Scales** and under **Options**, check, **“Create Memo on Conn Click.”** Since the note is a memo, it can easily be edited and/or deleted by right clicking on it.



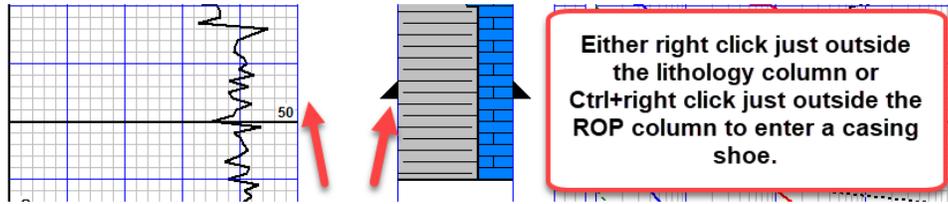
After the connection memo is displayed **“Right-Click”** on the new connection memo and set all the options in the memo edit dialog, such as font size, color and the location. Once configured, click save and then close.

All subsequent connections will now use the font settings and location specified in the first memo. Should you wish to change the settings later, simply edit the first connection memo or the memo at the depth where you want the changes to begin. For example, if the connection memo is on a custom track and changes to the custom tracks affect the memo’s location, you should edit the first memo on the log.

Alternatively, if the gas curve changes at a certain depth, you might choose to adjust the location starting from that depth onward. Make the necessary edits, check the "Update ALL Deeper Conn Memos" option, and click save.

Consequently, all existing connection memos deeper than the one edited will adopt the new settings. Additionally, all newly added connections at greater depths will follow these updated settings.

**Casing Points:** By holding the control button down and right clicking just outside the right side of the ROP column (Left side of Porosity column) or **just single right click** outside the left side of the lithology column, casing symbols will be placed on either side of the lithology column. To delete them, just press & hold Control while right clicking in the same spot.



**Trip for Bit (note):** A “Trip for Bit” note can automatically be displayed on the log by holding the control button down and left clicking at the depth **just to the left of the gas column** that you want the note. To remove the note, just click in the same spot that was used to make the note.



\*\*By adding the “Trip for Bit” note this way it will be added to the LAS file in the “CON” (Connection) column with the number ‘4’.

```

GRANWSH.perc      :Lithology
QT2WSH.perc      :Lithology
CON.unit         :CONNECTION 1=conn 3= csng pt 4=trip
C1.UNITS         :C1
C2.UNITS         :C2
C3.UNITS         :C3
IC4.UNITS        :IC4
NC4.UNITS        :NC4
IC5.UNITS        :IC5
NC5.UNITS        :NC5
  
```

~A	MD	TVD	DEV	AZM	VS	Rate/MF	Rate/FH	10FT	5FT	GR	ANH	CHT	LS	CO	SALT	GR	GW	QW	CON	C1	C2	C3
4081	0.0	0.0	0.0	0.0	0	0.75	80.0	-999.2	-999.2	-999.2	0	0	0	0	0	0	0	0	0	40	21	1
4082	0.0	0.0	0.0	0.0	0	1.90	31.6	-999.2	-999.2	0.0	0	0	0	10	0	0	0	0	0	77	40	3
4083	0.0	0.0	0.0	0.0	0	1.80	33.3	-999.2	-999.2	-999.2	0	0	0	10	0	0	0	0	0	77	40	3
4084	0.0	0.0	0.0	0.0	0	3.27	18.4	-999.2	-999.2	0.0	0	0	0	10	0	0	0	0	4	75	35	3
4085	0.0	0.0	0.0	0.0	0	1.42	42.4	-999.2	1.8	-999.2	0	0	0	10	0	0	0	0	0	75	35	3
4086	0.0	0.0	0.0	0.0	0	1.28	46.8	-999.2	-999.2	0.0	0	0	0	10	0	0	0	0	0	139	66	7

## Descriptions

There are two ways descriptions can be entered. One is by using “Memos as Descriptions”, (See [Memos as Descriptions](#)) which offers many advantages & options or by the original method described below.

To enter descriptions, locate **Descriptions...** on the toolbar under **Enter Data** or by double clicking in the description column. It will either prompt you to enter a

depth or place your cursor at the last spot you entered descriptions. Enter your description and then press the save button. To start a new line, you must press enter. When the maximum number of characters has been entered on a line the cursor will not move and a Beep will sound. You can add one more character by pressing **Ctrl+Tab**. The arrow keys will move you left and right and up and down to make corrections. To save the new descriptions, press the **SAVE** button, if you do **not** wish to save your work, press **cancel**, and any new work done **not be saved**.

Descriptions can be entered on a 1-inch format as well in later versions of the program. This can be done directly by starting the enter description function while a 1-inch log is displayed on screen. This can also be done when entering descriptions on a 5-inch format by making the first character of the description a ">". This will cause the description to be copied to the 1-inch format, providing there is room in the file and there is not a description already saved in the records involved. If there are 1-inch descriptions in the file they will also display on a 2-inch but will be spread out to cover the same number of feet.

When printing, you can choose to print the 1-inch log with or without the descriptions. (Assuming you have used one of the above methods to enter them).

**\*\*\* Copy and Paste is enabled with some clients; the following instructions apply.**

You can still use the standard MainLog text editor for descriptions, and in fact must use the old method to enter or edit descriptions more than 200 ft above the depth of the last line of description, or when entering descriptions on a one-inch log.

To enter "copy paste" mode, **hold down the control key, and double click in the description column below your last description**, or at the depth where you want to start editing/entering (within 200 feet of the deepest description line) Click the mouse at the line where you want to start, and either start typing, or right click to select paste if there is text already copied from somewhere else. If you "ctrl + double click" below the last description you will not see the last description in the text editor box, so you may want to click above it, so you see it in the text editor and know where to enter your next description at.

Optionally you can select any description or part of a description that you can see in the editor box, right click and select copy. Then click the cursor on the line where you want to paste, or press enter to move down to the line, right click, and select paste. You can also use "ctrl V" or "shift insert" as with any text editor in Windows.

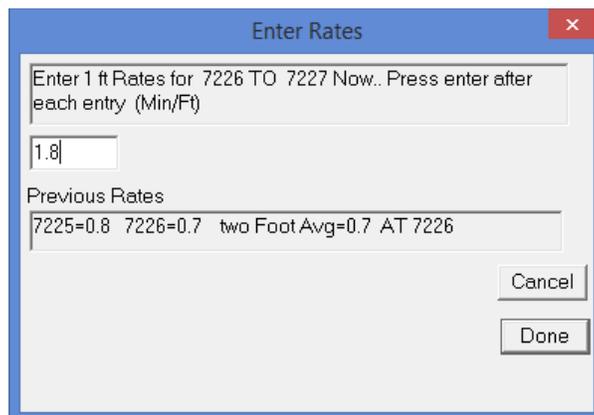
Please keep in mind that when you hit enter, or paste text in above existing text, ALL THE TEXT BELOW IT WILL MOVE DOWN. YOU MUST DELETE EMPTY LINES SOMEWHERE TO GET THEM BACK UP TO THE DEPTH WHERE THEY BELONG. This is true even if the text is below the bottom of the screen, and you cannot see it. This is one reason for the 200 ft limit.

The new editor works just like “NotePad”, “WordPad” or “Word” with one major difference; NotePad, WordPad or Word will just add lines and/or pages if you keep adding text, either by inserting, pasting, or typing. With a mudlog you only have space to the end of the file. In some cases, you cannot add text without first deleting empty lines, by simply pressing the delete key. By default, you should be able to add 5 lines without having to delete any. This will not always be true, depending on how many lines are available.

All or most of the editing features you would expect with word processing programs will work here. This includes word wrap at the end of the line, inserting text anywhere in the line, and copying and/pasting text, provided there is "ROOM" available, or in other words, available empty lines to fill. Copy and pasting from the software program “Litho-logic” will also work.

### **ROP Rates (Enter & Edit)**

Use the Rates option to enter or correct drill time. It is located under *Enter Data* on the toolbar as *Rates....* After selecting this option, it will ask you to enter a depth. (Note: You can also double click in the ROP column at the depth you want to edit, and the same menu box will open) **\*\* If you are using “Memos” you will need to press “Ctrl + Left Click” to open the “Enter Rates” dialog.**



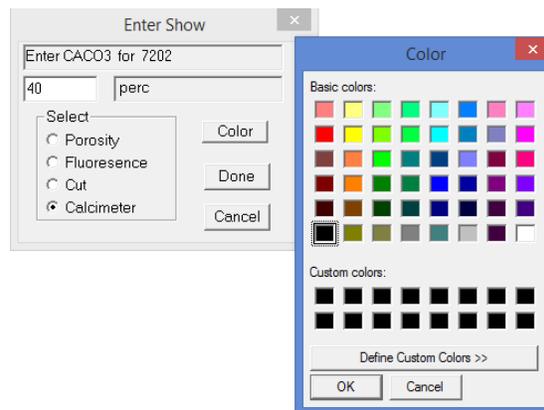
Once you have done this, it will let you start entering one-foot rates. Rates can only be entered as one-foot rates. If you are in two- foot or ten-foot mode when you start this function, the screen will redraw in one-foot mode. When you select the

done button, the program will reset to the rate mode you were in when you started. To quickly change a long foot from a connection, double click 2 ft above the rate you want to change, and then press enter twice. Then click done.

## Shows

To log shows, look under the **Enter Data** menu on the toolbar and select **Shows....**, it will prompt you to enter a depth. Enter the depth you want to start logging shows and press **<Enter>** or click **<OK>** to continue. You can also double click on either the porosity, cut, or fluorescence column to do the same.

After entering a depth, a dialog box opens where one can log **Porosity**, **Fluorescence**, **Cut** and **\*\*Calcimeter or Hardness**. To change between them, check the box that corresponds to what you want to log. There is no need to exit and re-enter a Show Depth, as checking between the Show options, will go back to the depth that was originally entered.



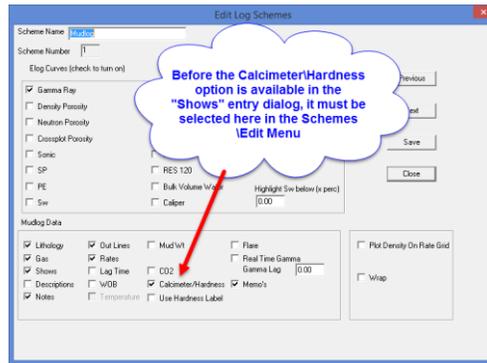
For **Porosity**, you can log trace (t), poor (p), fair (f), or good (g), with the appropriate letter.

For **Fluorescence**, enter the percentage followed by trace (t), poor (p), fair (f), or good (g). If you enter only a percentage, it will default to good. The color of the fluorescence is defaulted to “black”, but by checking “Color”; it can be changed to depict the actual color of the fluorescence.

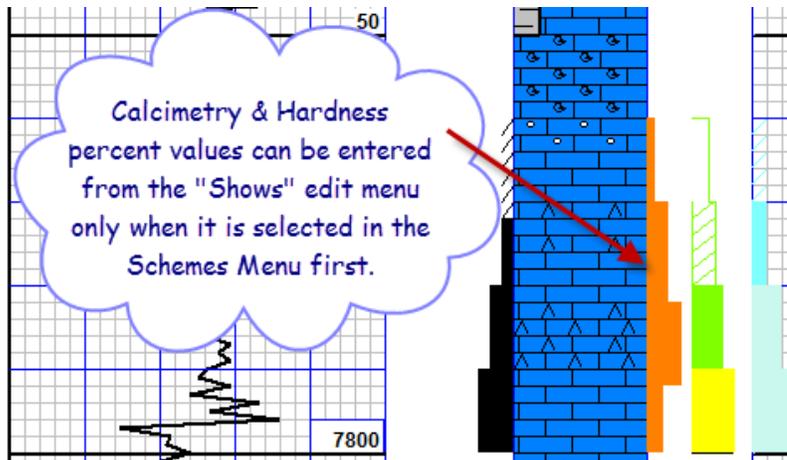
For **Cut**, you can log trace (t), poor (p), fair (f), or good (g), with the appropriate letter. The color of the cut is defaulted to “black”, but by checking “Color”; it can be changed to depict the actual color of the cut.

For **\*\*Calcimeter/Hardness** – Before the **Calcimeter/Hardness option is available in “Shows”, it must be selected from the Schemes/Edit Menu.** Check

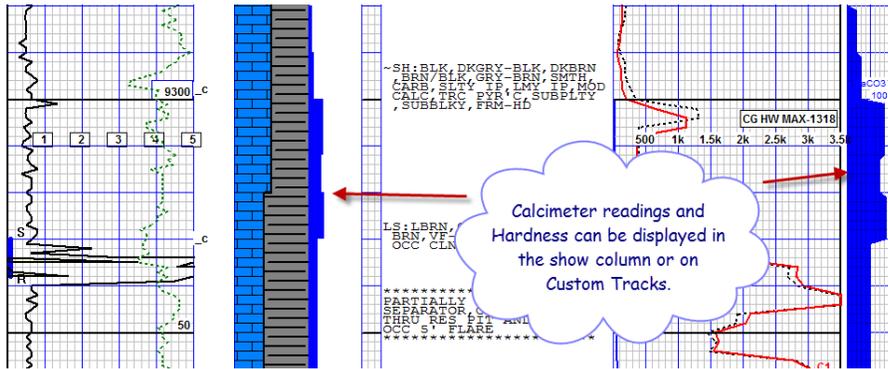
the box, “**Use Hardness Label**”, if “hardness” is the data you are displaying, and it will be labeled as such on the header, otherwise it will be labeled “CaCO<sub>3</sub>”. The color displayed defaults to “black”, but it can be changed to any color. (i.e., blue for calcium and orange for siliceous). It will maintain the color selected the next time you re-enter “Shows”. Also, whatever color chosen here will be displayed on the horizontal log as well.



Enter the percentage of Calcium or Hardness. The values are added in a “widened” fluorescence column as shown below.



They can also be displayed on **Custom Tracks** as shown below.



Once finished entering values, click the **<done>** button with the mouse.

## Out-Line

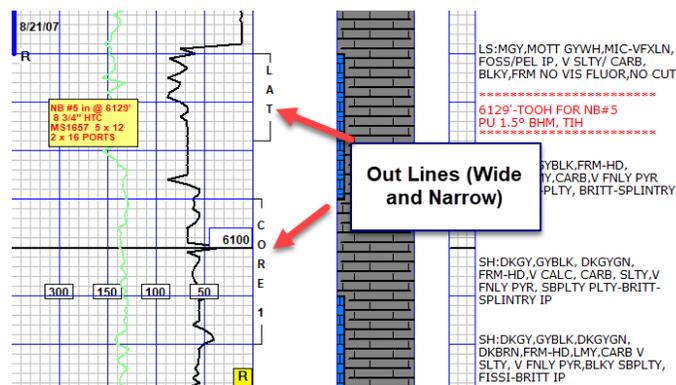
The **Out-line** feature is used to label depth intervals, such as, **LAT (Logged After Trip)**, **DST's**, **Core's**, etc..... It is located under **Enter Data** on the toolbar as **Outlines....** A dialog box will appear and ask you for an interval and text. After entering your text, you can choose between narrow and wide position. When you are finished, click **<save>** and then **<done>** to exit. If you make a mistake and want to erase, enter the same interval, and click **<delete>**. It should then immediately erase the outline.

Interval Outline X

Top of Interval  Bottom of Interval

Position  
 Narrow Position  
 Wide Position

Text



## Survey – Horizontal / TVD Inputs

Surveys are entered in this dialog to create a horizontal or TVD log. When at least three surveys are entered and there is a significant change in inclination, MainLog will create the horizontal 5, 2 and 1-inch log. It is recommended that you view the horizontal log after making an entry to ensure that the curve “looks” proper, and a survey number was not entered in incorrectly. **MainLog will also add the horizontal and surveys to the quick view menu.**

MD	INCL	AZM	TVD	VERT SECT	DOG LEG SEVERITY
6002.00	78.50	236.70	5898.80	402.00	0.00

Last Entries

- MD=6002.00 Incl=78.50 AZM=236.70 TVD=5898.80 VSec=402.00 DLS=0.00
- MD=5970.00 Incl=72.50 AZM=236.30 TVD=5891.10 VSec=372.00 DLS=0.00
- MD=5938.00 Incl=66.80 AZM=237.20 TVD=5879.90 VSec=342.00 DLS=0.00
- MD=5874.00 Incl=56.40 AZM=237.00 TVD=5849.60 VSec=286.00 DLS=0.00

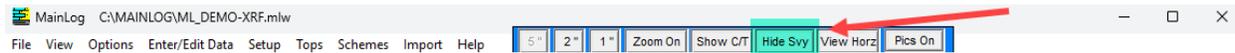
There is a **Delete All** button which will give you the option to delete all the surveys and start from scratch or re-import the surveys.

ANYTIME, **(Including in the Office Version)**, the appropriate survey data is contained in the MD file, a TVD file can be created by going to **View...TVD Log**. **Note, if no surveys are entered or if the difference between the MD and TVD is less than six feet then there is no option from View\TVD Log.**

Note: Surveys can also be imported if they are in a LAS format and the data is in the Ascii section of the LAS file. This can be done by selecting **Import\Import Mudlog Data**.

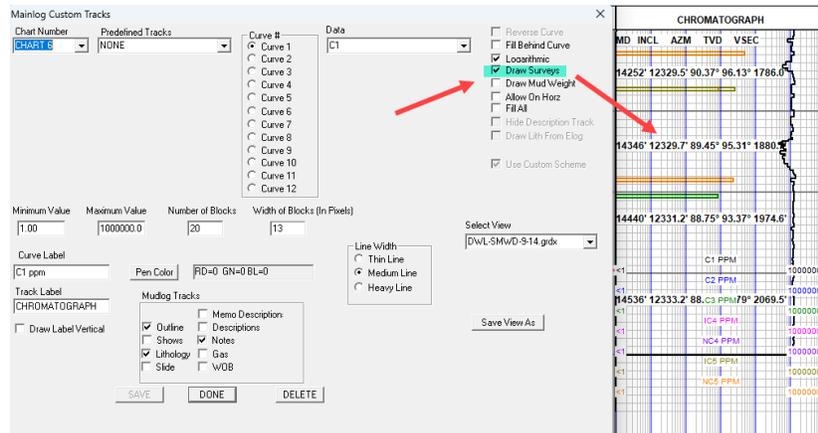
## Surveys on the Log

Surveys can be displayed on and off the log in a variety of ways. The fastest and easiest way is the **Quick View Bar** at the top of log. You can toggle between **Hide Svy** and **View Svy** to display them on the log. The position of surveys will vary between the 5", 2" and 1" log, as well as Client preferences.



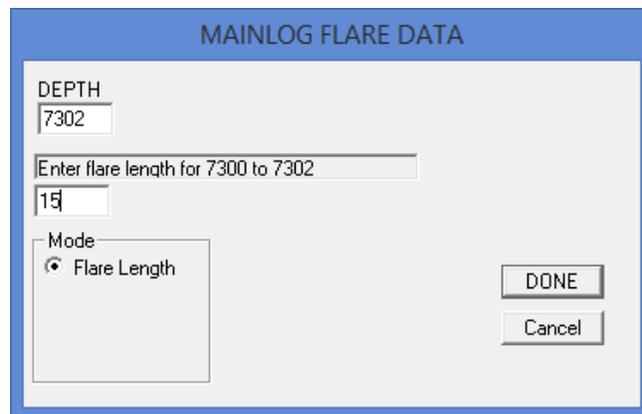
Surveys can also be turned on and off from **Setup\Lines and Scales** under **Options**. There is also a check box for **Alternate Survey Position** that will move the surveys from the gas track to a track next to the ROP track.

In some instances when using multiple custom tracks for a log format the typical position of the surveys may not be practical. In this case you can try turning on surveys on the custom track itself. From the **Custom Track Dialog** check the box **Draw Surveys** on the column you want. Click **Save** and **Done**. Remember to save the view when prompted overwriting your previous saved view.



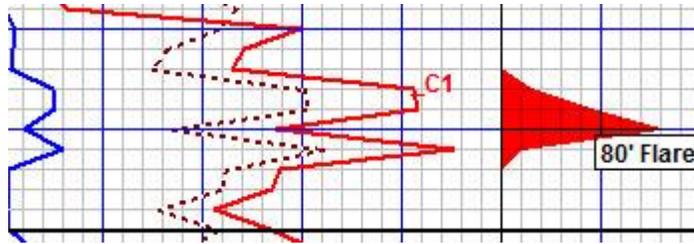
## Flare Data

Flare Data can be entered by clicking on **Enter/Edit Data** and selecting **Flare Data**. Flare lengths can be displayed on the mudlog by entering in the depth and the length of the flare. They cannot be entered in in **“Office Mode”**; however, they can be turned on or off and displayed on **“Custom Tracks”** from the Office Mode.

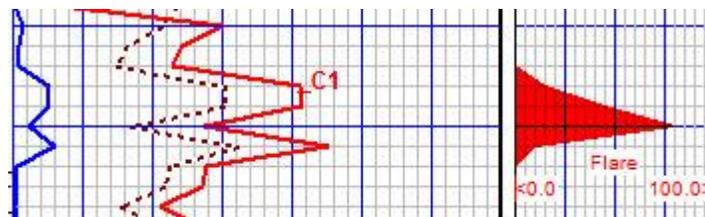


To display the flare data in the gas column, go to **Schemes\Edit** and check the box

“Flare”. The last two major grids in the gas column are a “0 to 100” scale.



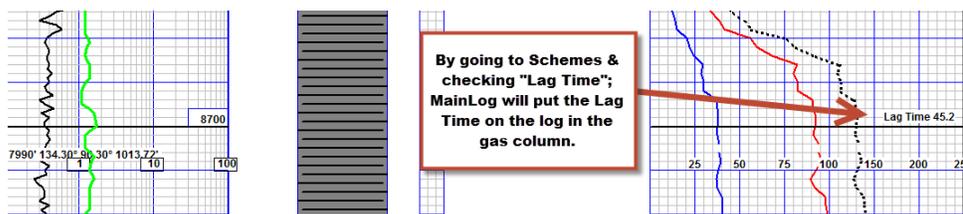
Flares can also be drawn on custom tracks. Turn on “**Custom Tracks**” from the **Set-up\Lines & Scales Menu**. Right click on the custom track and select “**Flare**” under “**Data**”. See “**Enable Custom Tracks**”. Flare color can also be changed by going to **Setup/Log Colors**.



## Lagtime

To enter a new lag time, **(in minutes)** from the tool bar, choose **Enter Data** and select **Lag Time**. In the dialog box enter a new lag time and click **<OK>**. The program automatically adjusts the lag by taking the depth and dividing it by the current lag time. It then adds to the lag as it drills deeper. Remember not to trust the computer completely and to run carbides accordingly. If you use strokes, see more about lag using strokes below.

The Lag Time can automatically be put on the log by checking the “Lag Time” box in the Scheme’s Menu. It will display every one-hundred feet in the gas column.



## Lag Using Strokes:

**Using a WITS feed to track lag by strokes:**

Typically, there is a WITS feed to MainLog, and a “Virtual” stroke counter can be setup using the SPM information in the WITS feed. To turn strokes on, open the **Lag Calculator** under **Setup**, fill out all the required information, and check “**Lag Using Strokes**”. The WITS feed must be enabled and receiving data for the option to be available. **If the option to use “Lag Using Stokes” is not available, then some information is missing or wrong.**

**It is particularly important to set the pump information correctly when you enter the lag calculator to turn on “Lag Using Strokes”, be sure to follow these instructions.**

**FOR EACH PUMP THAT COULD BE USED ON THE HOLE...**

1. Check “**On the Hole**” for that pump.
2. Enter “**Barrels Per Stroke**” for that pump.
3. Enter “**Pump Efficiency**” (see **Note** below)

When a WITS feed is coming in with SPM, **MainLog will automatically populate the SPM for each PUMP.** When all the fields in the Lag Calculator are properly entered, including **Bbls/Stroke** and **Pump Efficiency**, MainLog will “Pre-Load the Hole” and calculate the lag.

**Note:** Loggers need to inquire with the rig whether the BBLs/Stroke used includes the **Pump’s Efficiency** before filling in the values in MainLog’s Lag Calculator. If the Bbls/Stroke used by the Rig and/or Mud Man already includes the pump efficiency in its calculation, (which most likely it is), then in MainLog’s Lag Calculator the “Efficiency” should be 100%.

**With an incoming WITS feed and SPM coming in, MainLog will automatically populate the Strokes/Min values.**

**By entering in hole dimensions, pipe dimensions, bbls/Strokes, and pump efficiency MainLog will pre-load the hole for calculating lag.**

Current Depth: 8910

	Casing	Liner 1	Liner 2	Open Hole	DC-1	DC-2	DC-3	DP-1	DP-2
Inside Diameter	8.750	0.000	0.000	8.500	2.750	0.000	0.000	4.276	0.000
Outside Diameter					6.500	0.000	0.000	5.000	0.000
Length	5000.00	0.00	0.00	3910.00	880.00	0.00	0.00	8030.00	0.00

Total Hole Volume: 646.02  
 Annular Volume: 414.99  
 Drill String Volume: 149.03

Drill String Displacement: 82.00 Gal/Stroke, 3.19 Gal/Min, 472.42 Bbls/Min, 11.25

LAG TIME NOW Based On Current Wits SPM: 36.89 at 148 SPM

Pump	Strokes/Min	bbls/Stroke	Efficiency	On Hole
Pump 1	71	0.076	1.000	<input checked="" type="checkbox"/>
Pump 2	77	0.076	1.000	<input checked="" type="checkbox"/>
Pump 3	0	0.076	1.000	<input checked="" type="checkbox"/>

Calculate  Lag Using Stokes

The information in the Lag Calculator is used for pre-loading the volume of the hole to calculate lag. Once **“Lag Using Stokes”** is checked and the dialog is closed, MainLog will use the SPM coming in on the WITS feed and will change the lag accordingly.

If there is no WITS feed, the logger can fill in SPM to determine a theoretical lag. If a WITS feed is connected, and the Lag Calculator is re-opened, MainLog will auto correct the SPM to the current data coming in. **“Lag by Strokes”** can then be selected, providing all the information in the lag calculator is entered in correctly. MainLog does error check data entered in; however, it cannot foresee all the possibilities. If you get a message that **“data is out of range”**, then something was entered in wrong. Double check all information.

## Lag Time Measured

If a measured lag time is not entered, the measured lag time will be set to equal the calculated lag time. This is rarely accurate except at the bottom a casing run. If you enter a **“Measured or Proven Lag Time”** and the Lag time is longer than the **“Calculated Lag”**, (likely) the **“Washout”** percent will automatically be calculated when the measured lag time is entered, provided there is 500 feet or more of open hole. The washout value will be used to adjust the calculated lag to match the measured lag. The measured lag time is usually determined by dropping carbide or other means and is needed so that the lag strokes will work as accurately

as possible. The most likely reason the measured lag is longer than the calculated lag is due to washouts, and therefore it is always recommended to try and get a measured lag time and enter it in the lag calculator. Many loggers use “bottoms up” gas to determine actual lag time. This is gas from cuttings that accumulates on or near bottom when the pumps are shut off. It is only useful when drilling carbonaceous shales, or other rock that contains a fair amount of gas. You will get a small to moderate gas increase when this rock enters the agitator and can be an accurate way to determine bottoms up under certain conditions.

**\*\*Note: if a measured lag cannot be determined; The calculated lag will be used” Be aware that it will likely be inaccurate and will get worse as you get deeper.**

**\*\*The SPM info in the calculator is ONLY USED TO PRELOAD THE HOLE! Other calculations that use SPM use live SPM coming in on the WITS feed.**

### **How the Lag Calculator works**

The Lag Calculator uses volume to determine the bottoms up value, (Annular Volume), and combines SPM (strokes per minute) and BPS (barrels per stroke) and pump efficiency for each pump on the hole to track the samples and gas coming out of the hole. Once the information is filled out, you can enable the stroke counters and MainLog will accurately track lag, and update Bottoms up Volumes every foot. **If you are not sure the information you enter is correct, you should use time lag until you can verify it.** If the measured lag is greater than the calculated lag (likely), MainLog will calculate the “Washout Percent” after the measured time is entered. MainLog will increase the open hole size by the percent calculated, to determine annular volume, and thus lag barrels, strokes, and time.

MainLog will track strokes with accuracy within ABOUT 1 percent on a “typical” computer. This may vary a little depending on the speed of the computer and more so, by how many other programs are running, how many pumps are being tracked, (on the hole) and how fast they are pumping. It is the logger’s responsibility to verify the lag is being tracked correctly. It is possible under some circumstances that it will not work well, and Time lag should be used. It is the logger’s responsibility to be aware of what the lag depth should be and recognize any large errors on startup.

### **The Washout Factor**

The lag calculator is an accurate tool at the bottom of casing. The diameters involved in the calculation are for casing and do not change. As soon as you start drilling, this changes. The more open hole you have, the larger the error, and at some point, you should “verify” the lag time (or strokes) using carbide or some other means. When you run carbide for example, the result is likely to be longer than the calculated values when there is significant length of “Open Hole”. When you enter this value in the lag calculator, MainLog will adjust the washout percent and re-calculate until the calculated time /strokes is the same as the measured lag time /strokes. This will give you the most accurate lag possible. The calculator simply increases the open hole (or bit) diameter by the washout percent shown to do this.

## **Preloading the Hole**

When MainLog opens in drilling mode, it will try to determine what samples and gas are in the hole, and where in the hole they are. It does this by calculating and maintaining lag information including ROP and lag time for each foot for the last 800 ft. It then will adjust the total circulating time until the lag depth calculates to the depth of the deepest gas reading already stored in the file. It goes through a similar process when you change from lag by time to lag by strokes, and when you edit ROP. (To force a re-calculation, you can exit drilling mode and return to drilling mode). This process is not perfect but will usually get close to the actual lag depth on startup.

## **Mainlog will not overwrite gas already stored in the file.**

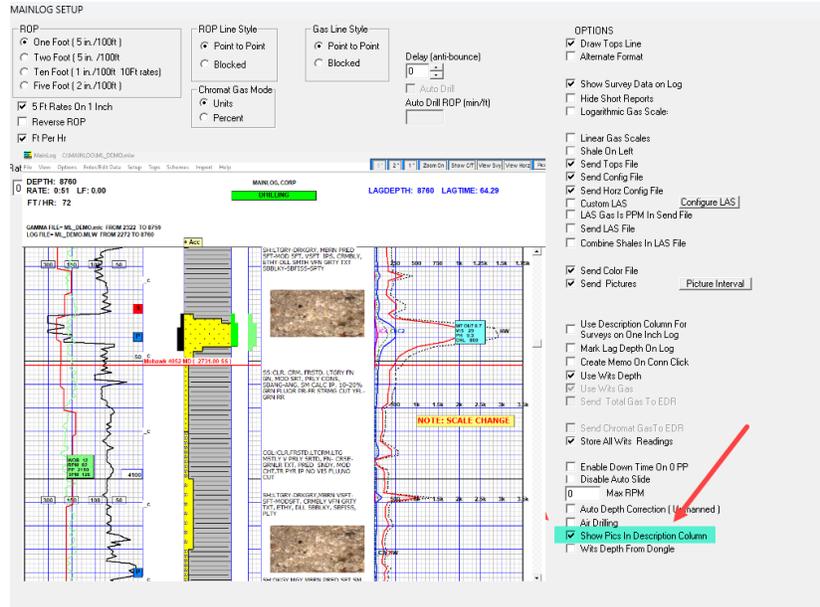
If the logger feels the lag depth is too deep, he/she should delete any gas stored in the file below where the lag depth should be, and then restart Mainlog to force a recalculation.

**\*\*\*ANY TIME YOU START MAINLOG WHEN THE RIG IS OR HAS BEEN CIRCULATING AND NOT DRILLING, THE PRELOAD WILL NOT WORK CORRECTLY, AND THE LAG DEPTH WILL NOT BE CORRECT UNTIL THE FIRST FOOT DRILLED IS LAGGED UP.**

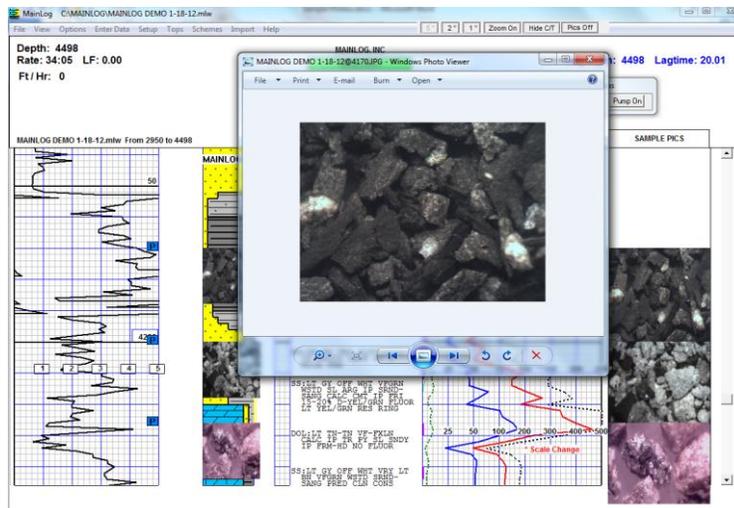
## **Insert Photos\Pictures & Iso-Tube Reports**

Adding a photo, (jpg) of a cutting sample to the log is simple to do. Take a photo of the sample and save it as a “jpg” file at the depth it was taken, (i.e., 7020.jpg) then copy it to the c:\mainlog directory. MainLog will then re-name it to <filename>@depth.jpg and create a folder in c:\mainlog\bitmaps\<filename> folder, and move the photo there. MainLog also imbeds the letter **P** on the log at

that depth it was taken. If necessary, documents can also be saved as a “jpg” and inserted the same way as a photo. Also, a **“Pic On/Off”** button is added to the **“Quick View Menu Bar”** which turns the photos on/off in the **lithology column**. In addition, in **Setup\Lines and Scales** there is a check box to **“Show Pics in Description Column”**. Check this box, then from the **menu bar** check **“Pics On”**, they will be in the description column.

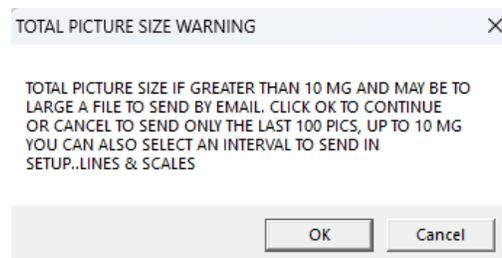


Photos can also be displayed on Custom Tracks. Under **“Predefined Tracks”** select **TEXT** and under **“Data”** select **Pictures**. One can customize the column by changing the **Number of Blocks** and **Width of Blocks** to fit their needs.



To add an **Iso-Tube Report**, save it as a “jpg” at the depth it was taken and add “iso” before the depth. (**i.e., iso7100.jpg**) MainLog handles it from there and imbeds the letters **ISO** on the log at that depth it was taken. The report is imbedded in the log and can be viewed when the symbol **ISO** is clicked on.

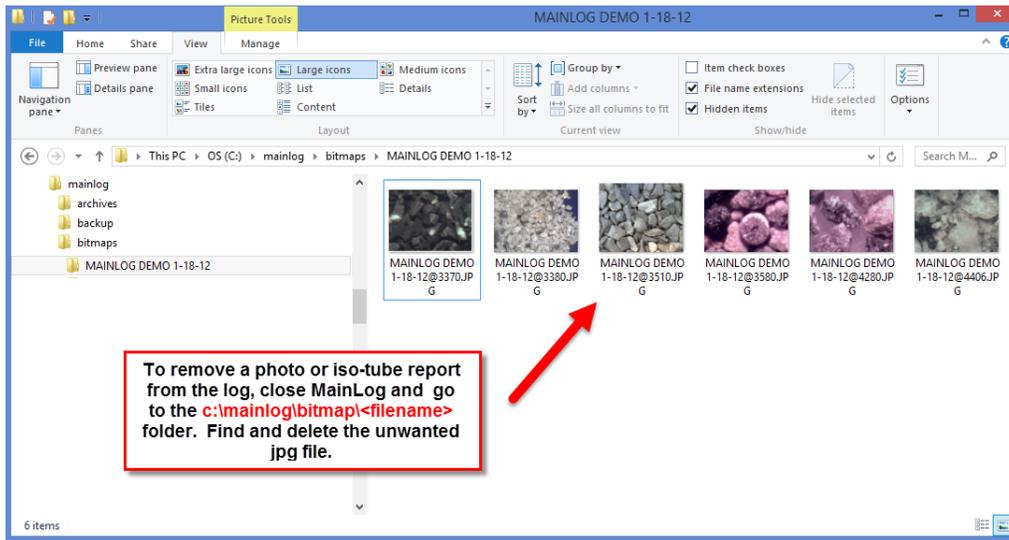
**Sending Pictures:** All pictures that MainLog handles are renamed correctly and copied to the **c:\mainlog\bitmap\< filename>** folder. To send pictures click on **File/Sendfile**. MainLog will look at the size of that bitmap folder, and a dialog will open with 3 options. Click **OK** to send all pictures, click **Cancel** to send the last 100 pictures or after cancel return to **Setup/Lines and Scales** and select a **Picture Interval** to send.



Since pictures do not compress, it may be that the file size could be too big to e-mail, so selecting Cancel or creating a specific interval may be the better choice.

Under **Setup Lines and Scales** there is an option to send pictures for a specific interval. Check the box **Send Pictures** and then click on **Picture Interval** and in the dialog enter the interval required. Save and close the Lines and Scales dialog and create a Sendfile. The pictures for that interval will be included in the **<filename>.ml\_** file.

To remove a photo or an Iso-tube report, close MainLog and go to the **c:\mainlog\bitmaps\<well filename>** folder and delete the jpg file. Upon re-opening MainLog the photo or report will be removed.



**\*Setup Menu (Some options are available in Office mode)**

These options can be found under *Setup* on the toolbar.

*Lines and Scales*

*Log and Lithology Colors*

*Gas Monitor and Wits Setup*

*Alarms*

*Lag Calculator*

*Test Gas Values*

*Real Time Updates*

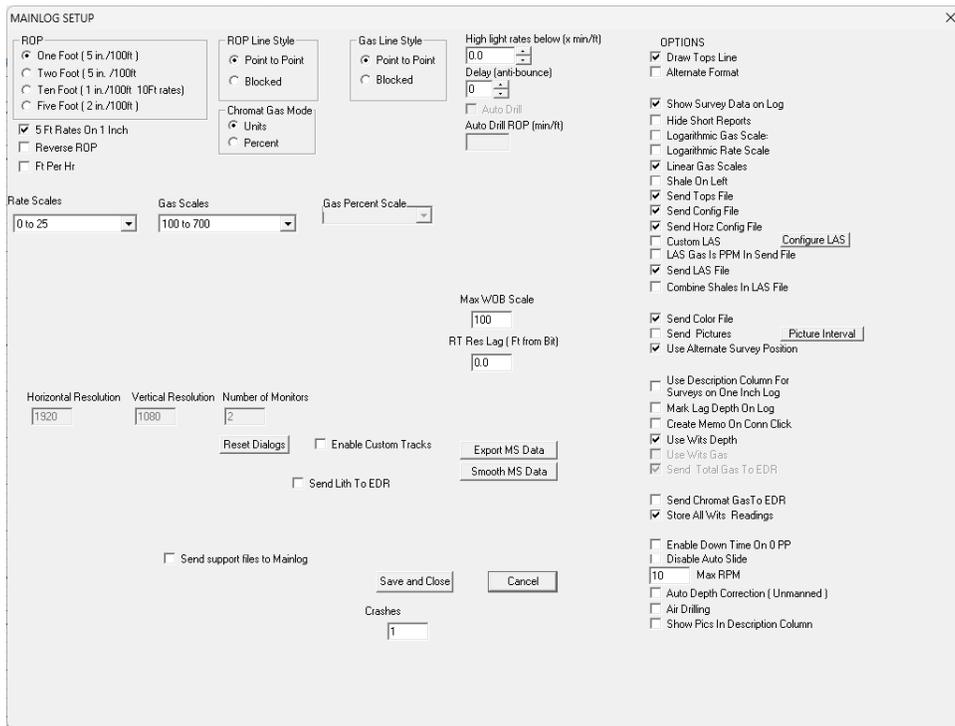
*Horizontal Options*

*Setup Custom WITS Feed*

*WITS on TCP*

**\*Lines and Scales (Also available in Office mode)**

This dialog allows the user to change the default line styles and scales used by the loggers in the field. There are many options that can be selected, they are listed and discussed below.



**\*Log Scaling (ROP): (Also available in Office mode)** Select this to modify the screen rates. Choose between one, two, ten, and five-foot rates. This is handy for correlation to different size logs. To select a rate, click next to one of the rates in the check box.

**\*ROP & Gas Line Style: (Also available in Office mode)** With this option, the ROP and Gas on the log can be viewed as either blocked or point to point. Choose by clicking in the check box next to the desired choice.

**\*Changing Rate or Gas Scales: (Also available in Office mode)** To change either rate or gas scales, click on the pull-down menu under rates scales or gas scales. This will give you several different scales to choose from. Select a scale by clicking on the option of your choice. Next, (and this is important) click on the box next to *Save scale as default* or *Save gas scale as default*. This will then bring up another dialog box asking for a depth to change the scale. Enter the depth and click <OK>. **Note:** if “**Linear Gas Scales**” are chosen under **OPTIONS** in the dialog, then different linear scales will be available. After choosing **Linear Gas Scales**, **Save and Close**, then re-open the dialog to view the linear scales.

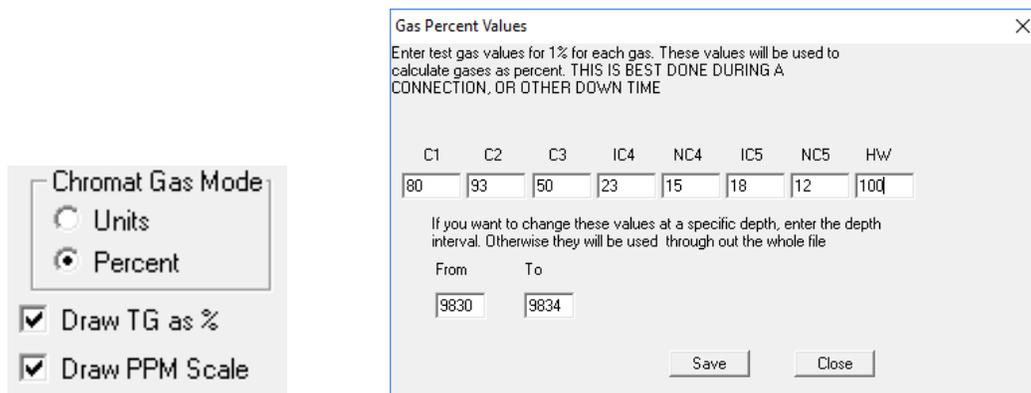
**Delay:** This sets a delay for recording a foot. For example, if it is set for 6 seconds, the computer will not respond to a foot drilled unless it is more than 6 seconds. The delay acts as an **anti-bounce** feature which was more appropriate for old style cable geolograph.

**Auto Drill:** If the WITS feed is down or the geograph line is broke and the rig continues to drill, by checking the “Auto Drill” box and **entering in an estimated drill rate in min/ft.**, MainLog will add feet to the log. You will need to keep up with the pipe tally and make depth corrections on Kelly down, but you will at least be able to track gas and collect samples while the WITS feed or geograph is being repaired.

- **Auto Drill mode will be turned off if MainLog is closed**
- **Auto Drill will not be available when using WITS depth (therefore you must uncheck “Use WITS Depth” to use Auto Drill)**
- **Auto Drill will be disabled when a new foot is drilled through a dongle box or if the hole depth increases through WITS**

**Chromat Gas Mode:** This option allows component gases to be displayed in gas Units or Percent. If Percent is checked, component gases will be displayed in percent, however, **calibration test gas values must be entered under, Setup\Test Gas Values.** If these are not entered correctly, the values displayed will be incorrect.

Also, if **Percent** is checked, the option to display **Total Gas, (TG)** as a percent becomes available. **If not checked**, the TG is displayed as **UNITS** using the 1-10000 logarithmic scale shown on the log. The option to **Draw PPM Scale** is also available. Scales on the log will be appropriate to the modes that are selected.



**The HW value in the “Gas Percent Values” dialog is for reference use only unless the “TG as Percent” is being used, then use either 50 or 100 based on the 1% calibration being used.**

**Note:** If an FID is being used, the test gas values must be set to 100.

**On Bottom Mode:** This is used when you are not getting a WITS feed for “on/off bottom” and you are using either a “dongle” box from an EDR provider or a micro-

switch & line from the rig's geograph on/off bottom lever to the "MainLog Depth box". Select whether the micro-switch is either "open or closed" when on bottom. When the geograph is kicked out, it will put Mainlog into downtime and stop the lag. When the geograph is kicked in you will be taken out of downtime. **If you do not have an on/off bottom switch, be sure to check the "disabled box".**

**\*Gas Percent Scale: (Available in Office mode)** This applies to certain clients who need to have multiple percent gas scales due to the equipment they are using. For most clients, the logarithmic percent gas scale is the norm.

**\*Temperature Scale: (Also available in Office mode)** For customers who are using a temperature sensor, various scales are available.

**\*Highlighting Rates: (Available in Office mode)** Enter a ROP (min/ft) and MainLog will highlight any rates faster than that ROP. This will highlight drilling breaks on the log. Select any ROP by clicking on the arrows or by clicking inside the box and entering a number with your keyboard. **Note: this option is not available in FT/HR mode and will not be seen in the dialog when FT/HR is selected.**

**Max WOB Scale:** Changes the WOB Scale in the ROP column when WOB is selected in Schemes.

## Other Options:

**\*Draw tops:** (read the Tops Menu before going on) If there are any tops entered on the log, they can be turned on or off by checking or unchecking the box. (Tops on if box is checked)

**\*Alternate Format:** This feature moves the description column to the right of the gas column. (Not available for all clients)

**\*Show Survey Data on Log: (Also available in Office mode)** Directional survey data can be displayed on the log. The information is displayed in the following order: TVD AZM INCL VS at the measured depth it was entered at. The "Quick View" menu box also gives you the ability to show or hide surveys on the log.

**Hide Short Reports:** Any short reports on the log can be hidden by checking this box.

**\*Logarithmic Gas & ROP Scales: (Also available in Office mode)** Enables the user

to use a logarithmic scale on the log. This is an on/off toggle. If the logger has been using different linear scales on the log and checks this box, MainLog stores the linear scales at the depth they were made, so if the logger unchecks “Logarithmic Gas Scale” or “Logarithmic Rate Scale”, the log will go back to the linear scales that were previously used. Note: if you used a “note” to show a scale change and go to logarithmic scales, those “Scale Change” notes will remain on the log and will need to be manually deleted if you decide to keep and print the log with the logarithmic scale.

**\*Linear Gas Scales:** When checked, all scales are linear. When unchecked scales are semi-logarithmic. **(Also available in Office mode)**

**\*Shale on Left:** When checked “Shale’s” will be drawn starting from the left side of the lithology column. (Enabled for some clients)

**\*Send Tops File:** The “Tops File” is a separate file for each well and will only be e-mailed in with the log if checked here. If geologists in the office have created their own “tops file”, it will be overwritten if you send your tops in for that well. It is always a good idea to check with the geologist before sending in a tops file. **(Also available in Office mode)**

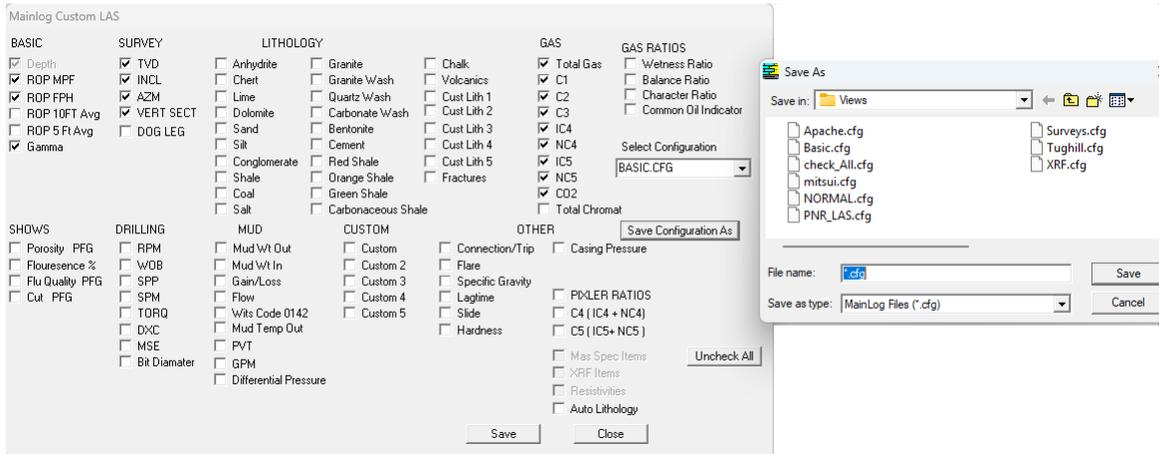
**\*Send Config File: (Also available in Office mode)** The configuration file for the vertical log can be sent in with the log. This enables everyone getting a log to see the same format, gas scales, etc. that have been used in the field.

**\*Send Horz Config File: (Also available in Office mode)** *This is defaulted to on and should remain on unless the logger is having issues e-mailing the log file in. Please contact us if this is an issue.* The configuration file for the horizontal logs is sent in with the log and enables everyone getting your log to see the same log format, gas scales, etc. that you have in the field. If you do not have this checked then any notes you have on the horizontal will not be sent in with the log, so it is highly recommended to have this checked.

**\*Custom LAS: (Also available in Office mode)** When “Custom LAS” is checked, the Custom LAS file that was built in the “Configure LAS Dialog” will be created with a “Sendfile” for e-mailing from the C:\mainlog\sendfile folder or manually under **Options\Create LAS File**. When un-checked MainLog will create its standard full LAS file with all data.

**\*Configure LAS File:** From this dialog a Custom LAS file can be built and saved. Select the data items from the list and MainLog will generate the LAS file when **“Custom LAS” is checked in Lines and Scales.** The configuration can be saved with the **Save Configuration As**, button with any name to be associated with a

client. (i.e., Texaco.cfg) Saved LAS config files can be retrieved from the “**Select Configuration**” dialog. A “Basic” config file is already on file and can be chosen and/or edited to meet the client’s needs.



With regards to **Mass Spec** and **XRF**, MainLog will only add the items that have an actual value to the LAS file. Should MainLog determine that Mass Spec data, XRF data or Resistivities were never read or imported during the well, they will be grayed out in the dialog.

When checked, **Auto Lithology** will only list the lithologies that are present on the log in the LAS file, including any Custom Lithologies that were entered, whether they are checked or not in the dialog.

**LAS Gas is PPM in Send File: (Also available in Office mode)** When checked MainLog automatically makes the component gases in the LAS file as PPM when creating a Send File. Total Gas will still be in Units.

**\*Send LAS File: (Also available in Office mode)** When this box is checked MainLog will automatically create <filename.las> file and put it in the **C:\mainlog\sendfile** folder when a “Sendfile” is created. It can be sent in as an attachment in an e-mailed. The LAS file is also zipped into the “ml\_” file.

There are numerous additional options, some available only for certain clients, some only when in drilling mode. Some options are only available when another option or feature is enabled. Most are self-explanatory, but if not sure, give me a call or drop me a quick email. (Help...About from MainLog program)

**\*Combine Shales in LAS File:** Various shales lithologies entered on a log can be combined into one column if desired.

**\*Send Color File: (Also available in Office mode)** When selected the color scheme

for the log will be sent in with the log file. Under the **Setup\Log Colors Menu** the pen color for items on the log can be chosen and now are stored in a separate file, <filename.clr> and will be sent in when this option is checked. The recipient will see the same colors as what is seen in the field on the mudlog.

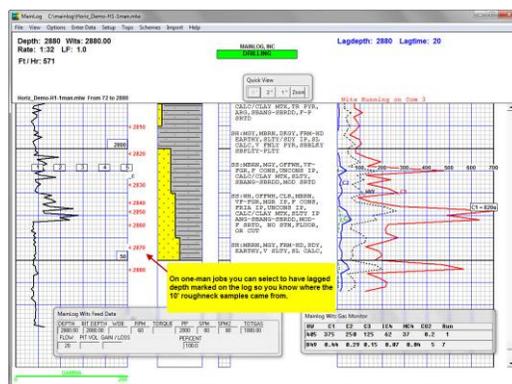
**\*Send Pictures:** Checking this box will place all pictures from the interval that was entered in the **“Picture Interval”** dialog and place them in the **“filename.ml\_”** file when a **“sendfile”** is created for e-mailing. MainLog will automatically uncheck the **“Send Pictures”** box in Lines and Scales, once the ml\_ is created, so as not to add the same photos again.

**\*Picture Interval:** This feature allows the user to select an interval with photo's to be added to the **“filename.ml\_”** file when a **sendfile** is created. Enter the interval, then check **“Send Pictures”** and when a **“sendfile”** is created they will be zipped along with the log file for e-mailing. This feature comes in handy if a client is missing some pictures or was added to the e-mail list later in the well.

**Use Alternate Survey Position:** When checked, Surveys will be placed in an alternate position other than the defaulted Gas column depending on the logging company's format.

**Use Description Column for Surveys on One Inch Log:** When checked the description column on a one-inch log will be used to display survey information.

**Mark Lag Depth on Log:** This is a useful feature for roughneck caught samples on one-man or two-man jobs. The lagged depth is shown to the left of the lithology column to show where the bagged and labeled samples came from.



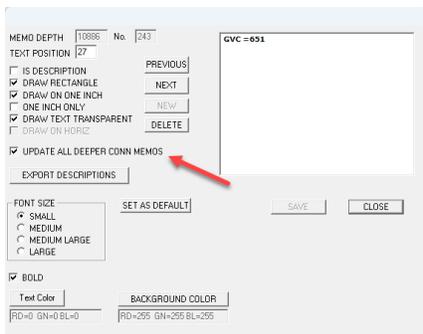
**Create Memo on Conn Click:** When checked, MainLog will automatically create a memo note, with the Total Gas value in the gas column, at the connection depth. Since it is a memo, it can easily be edited or deleted.

After the connection memo is displayed **“Right-Click”** on the new connection

memo and set all the options in the memo edit dialog, such as font size, color and the location. Once configured, click save and then close.

All subsequent connections will now use the font settings and location specified in the first memo. Should you wish to change the settings later, simply edit the first connection memo or the memo at the depth where you want the changes to begin. For example, if the connection memo is on a custom track and changes to the custom tracks affect the memo's location, you should edit the first memo on the log.

Alternatively, if the gas curve changes at a certain depth, you might choose to adjust the location starting from that depth onward. Make the necessary edits, check the "[Update ALL Deeper Conn Memos](#)" option, and click save.



Consequently, all existing connection memos deeper than the one edited will adopt the new settings. Additionally, all newly added connections at greater depths will follow these updated settings.

**Use WITS Depth:** When receiving depth from an EDR WITS feed, this box must be checked and is defaulted on when you turn on “WITS”. When using an IBall (Bloodhound) instrument, MainLog automatically defaults this to on. **Note:** Occasionally a rig may be washing to bottom and leave the geologist kicked in, which will give you false feet. To prevent this, uncheck “Use Wits Depth” until they are on bottom. This will allow you to keep the WITS and Gas Monitor on without getting false feet drawn on the log.

**Use WITS Gas:** If the instrument mode is “WITS or New Bloodhound (9600)”, the “Use WITS Gas” is defaulted on and is grayed out. There may be other instances when third party gas is coming in on WITS and may need to be plotted. (i.e., Pason Gas Detector).

**Send Gas Via WITS:** This will send the Total Gas, (HW, Infrared), out to the EDR provider so the gas can be seen on EDR workstations. **This is defaulted to on and grayed out, but upon request it can be enabled** so the “gas out” to WITS

from MainLog, can be turned off. There are some instances on “tight holes” where the company does not want the gas to be made public to everyone on location.

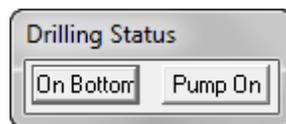
**Send Chromat Gas To EDR:** When checked, MainLog will send the chromatograph values, as well as CO2 (code 1222) to the EDR via WITS. MainLog automatically sends out Total Gas and Lagged Depth on all WITS connections to the EDR.

**Show Wits Error Msg:** When checked MainLog will send an “**Error Message**” stating that the EDR is sending too many bytes of information via Wits. We encourage you to go to the workstation or contact the EDR provider to only send the data that you need. (i.e. The items shown in the MainLog Wits Monitor dialog)

DEPTH	BIT DEPTH	WOB	RPM	TORQUE	PP	SPM	SPM2	SPM3
7146.91	7146.91	50	40	2818		85	85	85
FLOW	PIT VOL	GAIN / LOSS			PERCENT	BYTES IN	BYTES OUT	
0					100.0	1155	63	

**Enable Down Time On 0 PP:** On an EDR incoming WITS feed MainLog will automatically go into downtime if the Pump Pressure goes to zero (0). Typically, on ROP, MainLog will go into downtime when a rig picks up off bottom, however, many Top Drive Rigs do not pickup off bottom when making a connection. By checking this box MainLog will go into downtime on zero PP.

**WITS Depth on Dongle:** If an **I-Ball Instrument (Bloodhound)** or **Instrument Type “WITS”**, is only getting depth from a “dongle box” and not a full WITS feed from an EDR provider, then it is only sending depth out on a WITS feed to MainLog. If this is the case, then from Set-up\Lines and Scales, check the “WITS Depth on Dongle” box. It will give you the “Drilling Status” box so you can easily put the program in “downtime” during connections, trips, etc. and/or keep the lag running if circulating when not drilling for bottoms up, circulating shows up, etc.



Please note that when you put this in “off bottom” (downtime), MainLog will automatically go back to “on bottom” and “pump on”, when a foot is drilled.

**Disable Auto Slide:** Gives the logger the ability to turn off the automatic plotting of “Slide\Rotate” on a horizontal well.

**Max RPM:** When sliding, some rigs may still rotate at very low RPM’s, (i.e., less

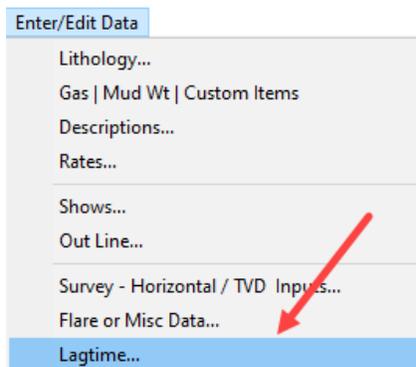
than 10) so a maximum RPM value can be entered in here so that any value seen below that will be considered a “slide”.

**Auto Correct Depth (Unmanned):** (Available for certain clients).

Normally when adding a foot to the log, MainLog just looks at the change from one depth to next and adds a foot to the log. When the “unmanned” feature is checked, MainLog tracks the actual depth coming in from the WITS feed. (i.e., 5000). If the driller makes a depth correction of, plus 10 feet to 5010’, MainLog automatically adds 10 feet to the log at 5000 correcting down to 5010 and makes a note on the log. (i.e., **Depth correction 5000 to 5010**).

If the driller makes a negative depth correction, MainLog will add a note to that effect and store a backup of the file at that depth in the backup directory.

**Air Drilling:** Check when drilling with air. The **Lag Calculator** and **Lag Using Strokes** is unavailable when Air Drilling is checked, so “**Lagtime**” must be set via, **Enter/Edit Data/Lagtime**.



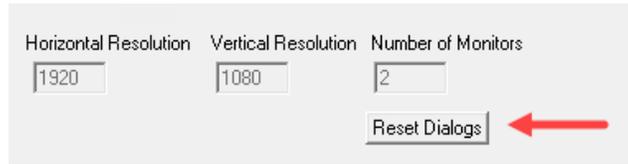
**MainLog assumes that the EDR is sending the Air Pressure as PP, (Pump Pressure)** and checking the box changes the PP threshold for lagging when off bottom to 50 psi, from the 300 psi when on fluid.

**Send Lith To EDR:** When checked, MainLog will send lithology codes out to the EDR via the Wits feed at the time it is entered in MainLog.

**Send XRF To EDR:** When checked, MainLog will send XRF data to the EDR at the time the XRF data is imported into MainLog.

**Reset Dialogs:** Occasionally, when using multiple monitors, the “WITS and/or Gas Monitor” dialog boxes and the “Quick View Tool Bar” may get lost off screen. This is likely due to different screen resolutions between the monitors.

By clicking on the “Reset Dialogs” button it will put those displays back to the bottom of the mudlog screen where the logger can see them again and reposition them as they please.

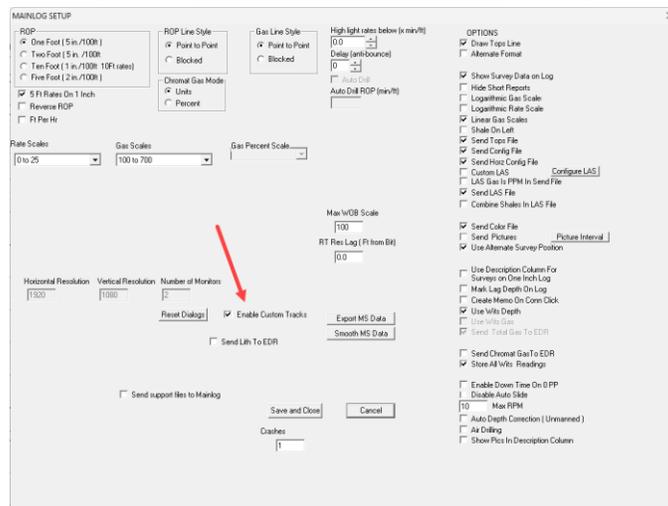


**Very Fast ROP:** (Not available for all Clients) Check this box when ROP is more than 500-600 ft/hr or if your ROP looks saw-tooth or jagged. **For this to work the EDR provider must be sending at one-second intervals.** MainLog will check every 1 second for depth changes. When properly set up, this should reduce the amount of feet lost between connections.

**Real Time Resistivity - RT Res Lag (Ft from Bit):** MWD Resistivity can be plotted real-time via a WITS feed. This is dependent on the ability of the directional company to send a WITS feed to the EDR and then WITS the data to MainLog. If the code is being sent to MainLog via WITS, it can be selected to draw on a **Custom Tracks**. The Resistivity lag will be tracked as well but can also be set in **Setup\Lines and Scales**.

**\* Enable Custom Tracks: (Custom Tracks - Available in Office Mode)**

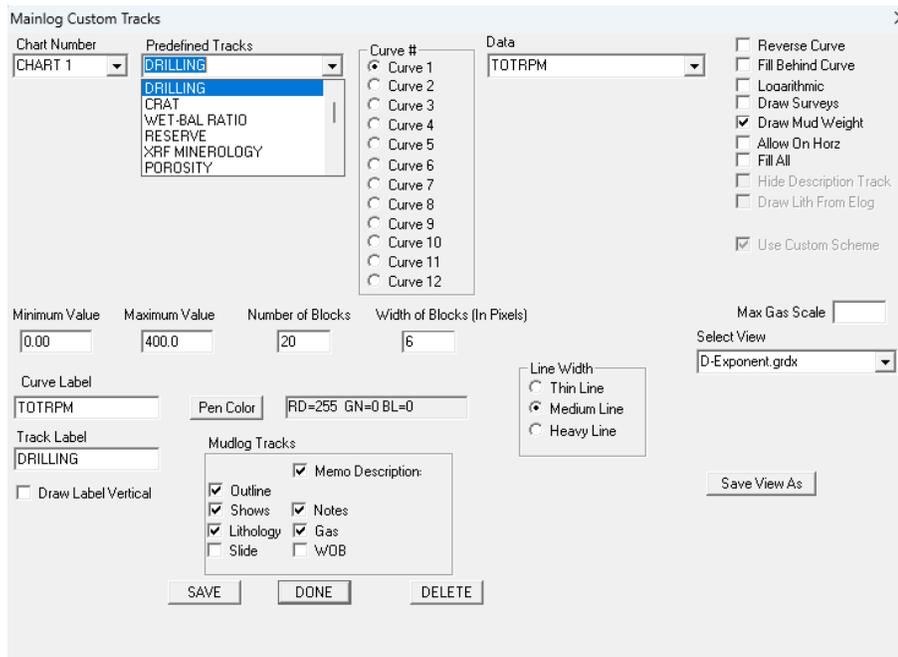
MainLog can plot many different data curves on the log by enabling “Custom Tracks” under “Setup Lines and Scales” or from the quick view bar click on “Show CT”.



When checked, fifteen custom tracks are available with the options to display eight different data curves on each track. You have the choice to display just one track and can size the track. Drilling parameters that are being WITS in, such as WOB, Torque, PP or SPM can be plotted. Hydrocarbon gases, as well as **CO<sub>2</sub>** and H<sub>2</sub>S can also be displayed. There are also **five “Custom” curves** which you can import and name. **(Note: H<sub>2</sub>S can only be imported as Custom)**

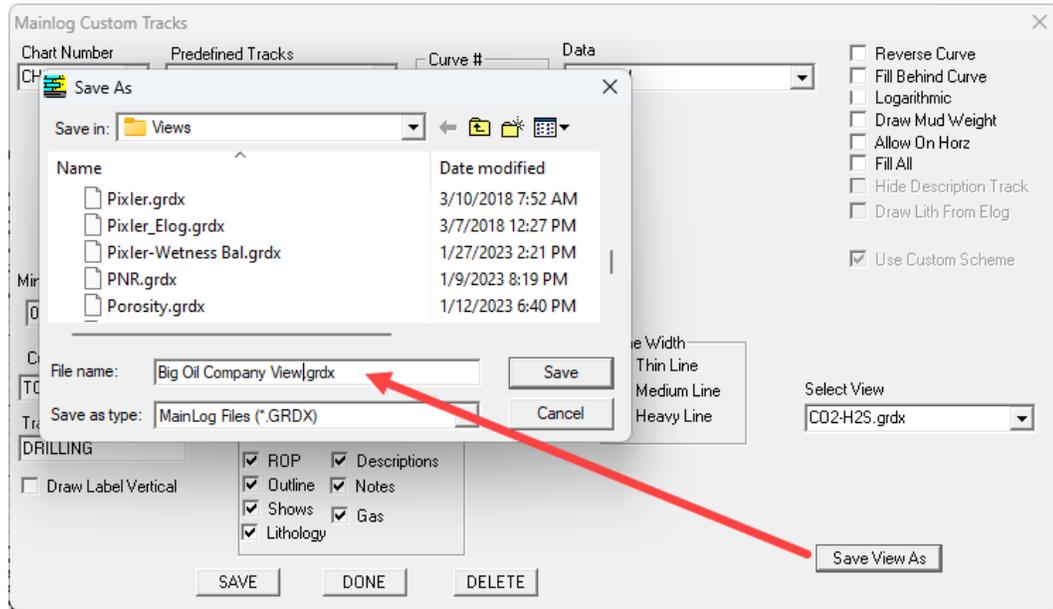
In the **Custom Tracks Dialog** there are a set of “Pre-defined” tracks that when selected will automatically populate the selected track and size it. These include such tracks as “Drilling Parameters”, Wetness-Balance Ratio”, Resistivity and Porosity tracks. Being pre-defined the user does not have to individually build the track and scales or select the curves.

As seen in the screen shot below, the **Mudlog Tracks** are available to turn **on/off** in the **Custom Tracks Dialog**, rather than in the **Custom Scheme Dialog**. “Views” can be saved to include information previously made in a separate step from the “Scheme Dialog”.

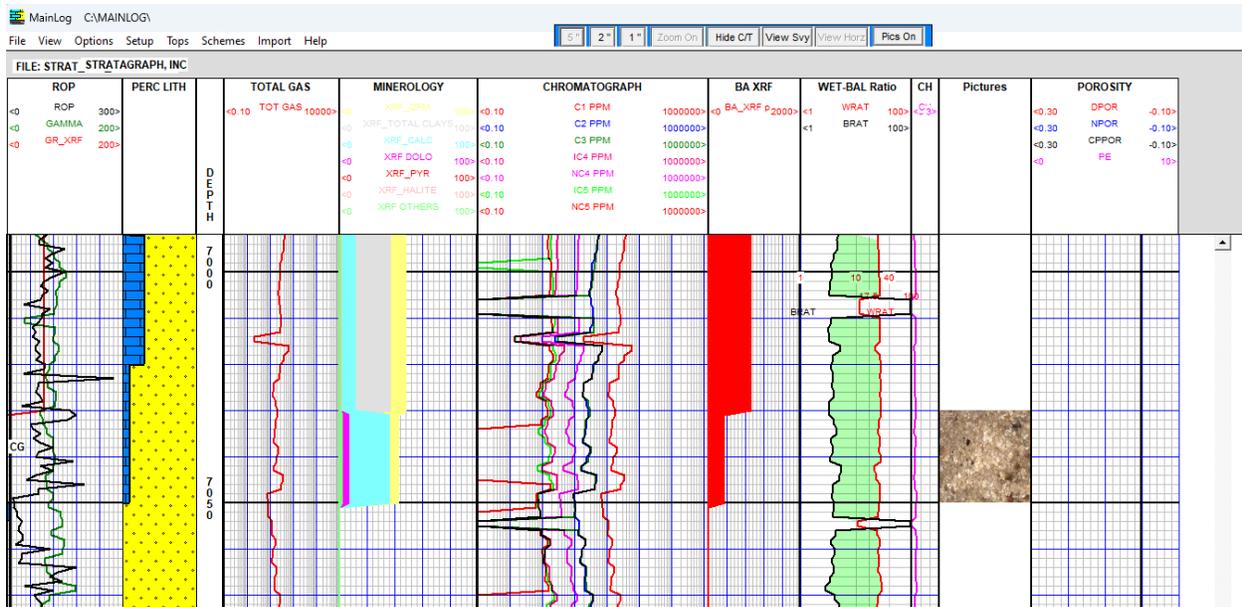


Tracks can easily be deleted by selecting the Chart number and clicking on the “Delete” button. They can also be moved by holding the “Control” key down and clicking on the right or left side track “Label” in the direction you want it moved.

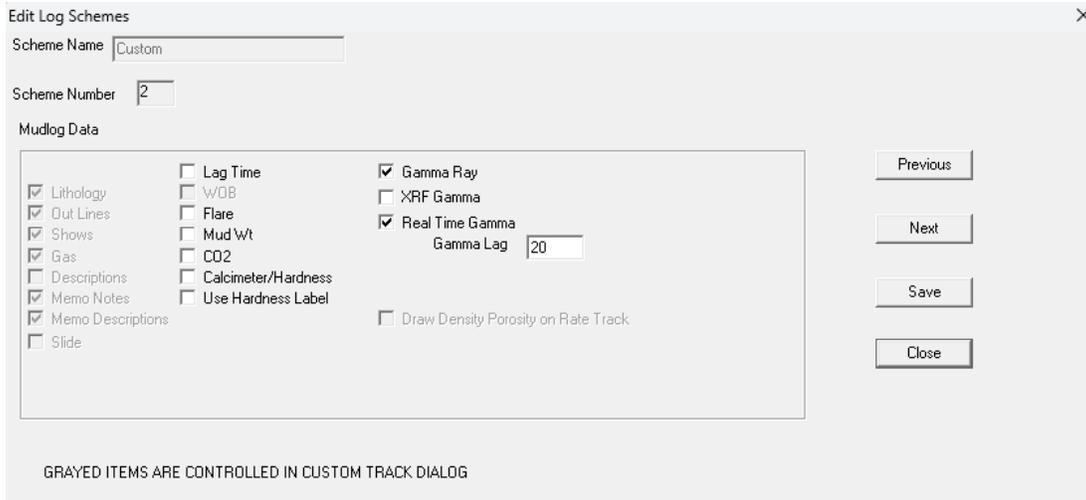
The “Save View As” button allows you to name and save a display of tracks that you created and go back to it at any time. Such as, “Ratio Tracks” or named after the client of yours.



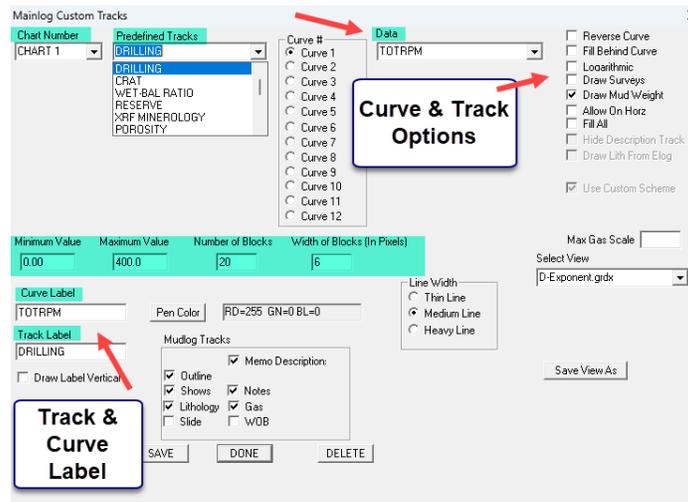
The display below shows a custom format that imported e-logs curves and XRF minerology data can be displayed on the same page.



Custom Tracks uses the “Custom Scheme”, and the Standard Log format will use the “Mudlog Scheme”. (See [Schemes Menu](#)) Most of the non-track items, such as Flare, WOB, Mud Wt., etc. can still be edited in the Custom Scheme Dialog, and any items that are grayed out, still can be edited in the Custom Tracks Dialog.



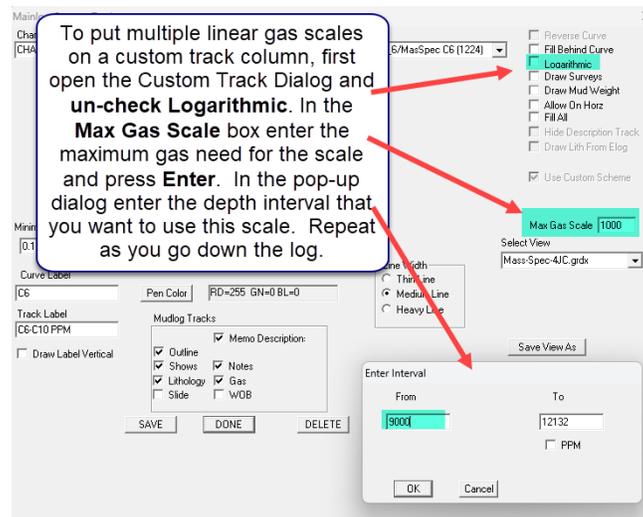
In addition to more than 10 “Pre-defined” tracks users can create their own tracks and scales. The “Data” list includes over 100 items that can be displayed, including various gas ratio curves.



## Gas Scales on Custom Tracks

When using a **Linear gas scale** on a custom **Total Gas** or **CO2** track, it is possible to have multiple scales at different depths on the track. Right click on the custom gas track, and from the dialog, in the **Max Gas Scale** box, type in the value of the maximum gas for the scale and press the **Enter** key. A dialog will pop up where you can enter the depth interval on the log for that scale. (The depth you want to start the scale and the depth you want it to go down to). Repeat to enter new scales as you continue down the log.

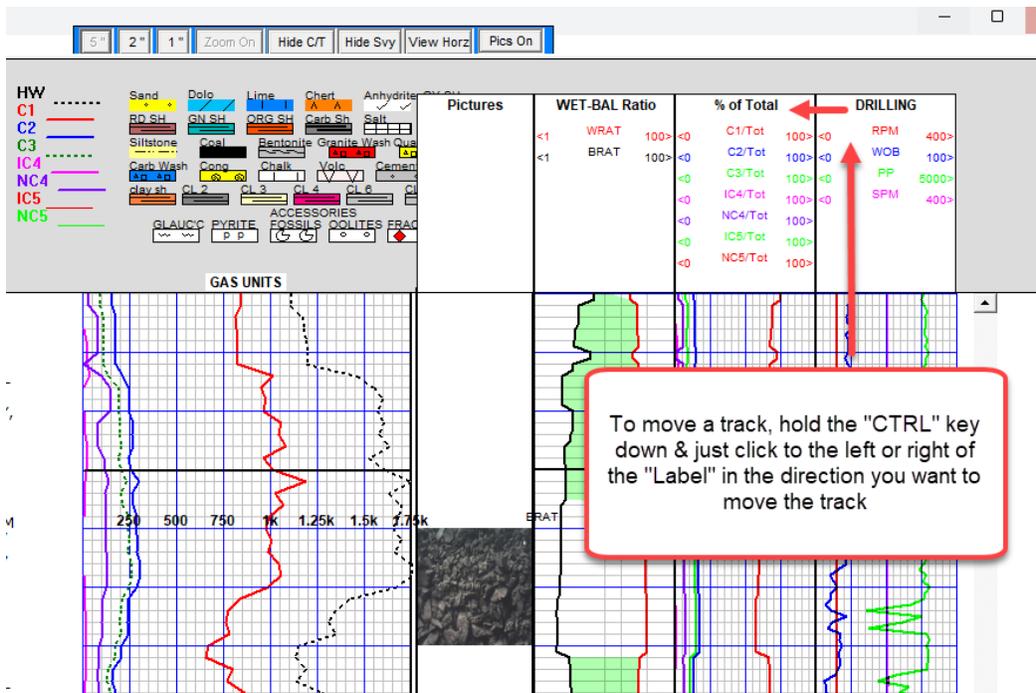
**To delete these scales, you must enter in “0” in the “Max Gas Scale” box. Then type in the entire log depth interval in the “Enter Interval” dialog. Save the View.**



## Steps to Create a Custom Track

- Turn on Custom Tracks. Right click on any custom track to bring up the **Custom Tracks Dialog**.
- Choose the Chart Number
- Choose the predefined track you want to use OR
- Choose the “Data” curve you want on a track; up to 8 curves can go on one track. Select line color & line width for each curve. **Click Save after each curve entry.**
- You can size the track by number of blocks and block width.
- Scale the track. \*Note that whatever scale you choose that will be the scale for the entire length of the track. Logarithmic may be the best option in some cases.
- Label the track and each curve on the track.
- Once a track is done click Save & start on a new chart number track if needed.
- Uncheck any standard tracks on the log you don’t need.
- If you want a track to be displayed on the horizontal check the box “**Allow on Horz**”.
- When completed click **Save and Done** & “**Save the View**” to a name of your choice.
- If you need to arrange the track, they can be moved by holding the “Control”

key down and clicking on the right or left side track “Label” in the direction you want it moved.



**Send Support Files to MainLog:** MainLog Support may ask you to check this box before doing a “Send File”. The Send File will include certain additional files that will help the Support Team to determine any issues you may be having. These include the mldata.txt file and any chart or Wits files from the current day.

## QC Ratio

QC Raio is used to ensure the gas equipment is working properly. It can be selected as a pre-defined track in the Custom Tracks dialog.

**Some key parameters that should be monitored :**

- **TG/ΣC** : main output to check that gas acquisition has been correctly carried out (FID : TG/SC > 1 or =1 if only C1)

- **TG/ΣC<sub>cor</sub>** (= TG / C1 + 2C2 + 3C3 + 4iC4 + 4nC4 + 5iC5 + 5nC5)

more useful output for QC when heavy components are present

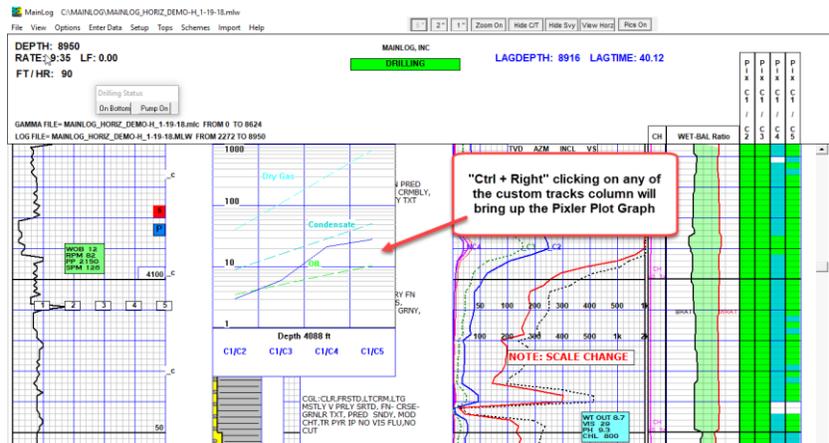
- TG/SC<sub>cor</sub> < 0.8           ⇒ calibration or instrument problems
  - 0.8 < TG/SC<sub>cor</sub> < 1.2   ⇒ equipment working fine
  - TG/SC<sub>cor</sub> > 1.2         ⇒ calibration or instrument problems
- presence of hydrocarbons C5+  
presence of organic matter

- **C1/C2** :

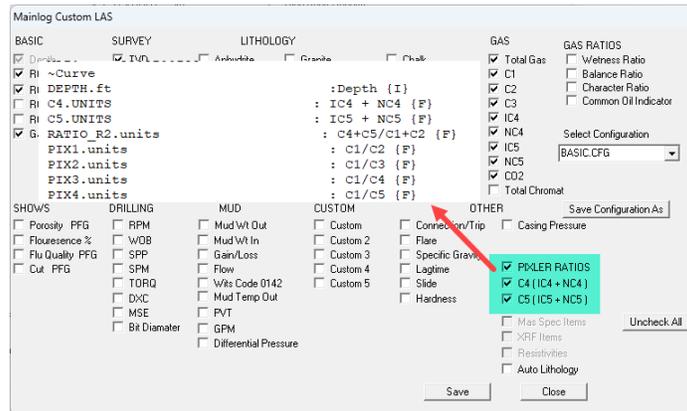
to check if the discrimination limit is about to be reached ; if stable, the system runs under good conditions

**Pixler Plot**

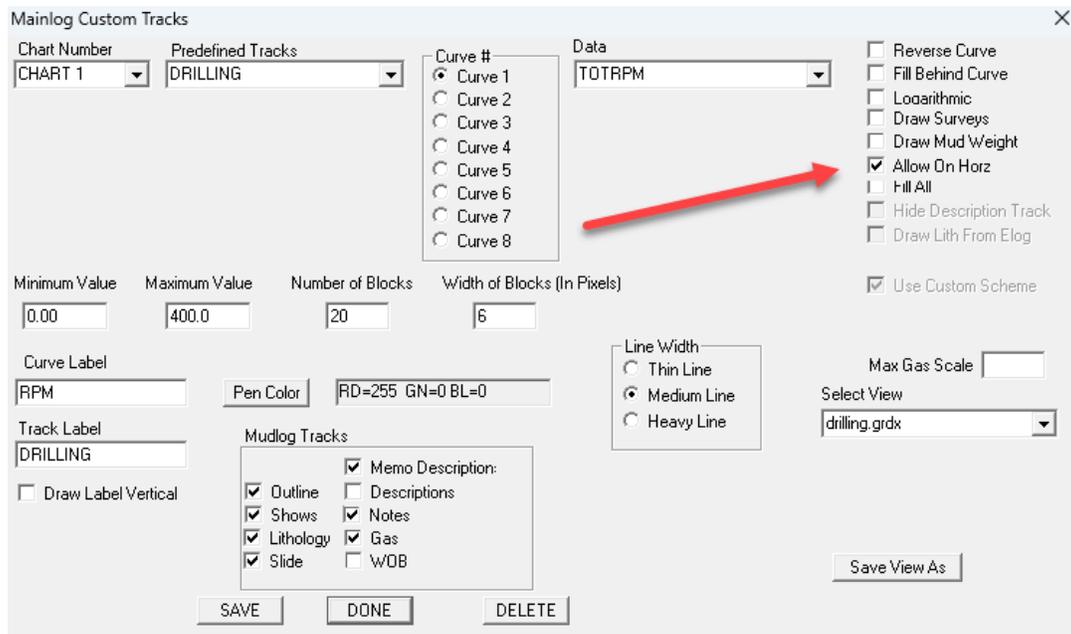
The Pixler Plot Graph can also be displayed. If any custom track on is, just **Ctrl + Right click** on any custom track and the Pixler Plot graph will appear on the log. It will show the results at the depth you clicked. You can also right click on the custom track to bring up the CT dialog and under “**Views**” choose “**Pixler.gdrx**” which displays the Pixler & Wetness Balance ratio columns. Rather than displaying curves in the Pixler column, MainLog shows a visual color display of each ratio and whether the “value” falls in the oil, condensate, dry gas, or a no result zone.



The Pixler Ratios can also be added to the LAS file by going to **Setup\Lines and Scales** then **Configure LAS** and select **Pixler Ratios**.



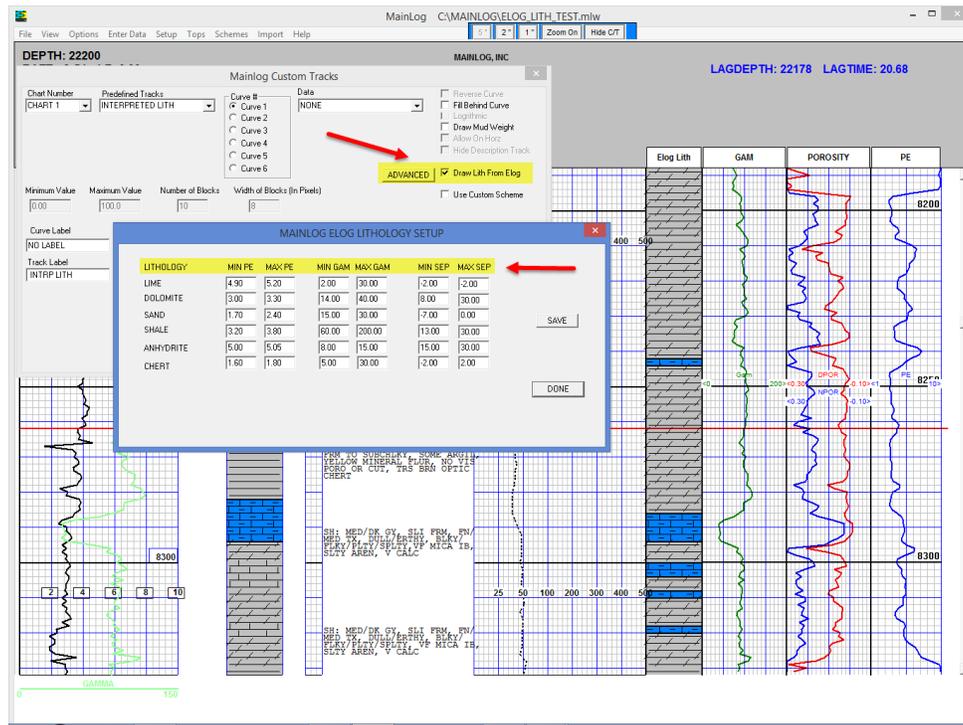
Custom tracks can also be displayed on the horizontal log by going to “**Horizontal Options**” and checking “**Draw Custom Tracks**”. Only four (4) custom tracks can be added to the horizontal log plus a description and picture track. In the Custom Tracks dialog, the ability to allow the track on the horizontal log can be selected. (**Allow on Horz**)



**\* Lithology Based on E-Logs (Available in Office Mode)**

Another feature in Custom Tracks is a lithology track that can be generated by the importing of the gamma, PE, and Neutron-Density curves. After the curves are imported from “**Import/Import E-Log Data**”, **turn on Custom Tracks and select “Interpreted Lith” under “Predefined Tracks”.**

Since the e-log curves were imported, an option in the MainLog Custom Tracks dialog is available to check, “**Draw Lith From Elog**”. By checking the box and clicking on the “**Advanced**” button, a “**MainLog Elog Lithology Setup**” dialog opens where the “minimum and maximum” values of the Gamma, PE and Neutron\ Density curves can be set to generate the lithology.



**\*Gas Ratios: (Also available in Office mode)** MainLog also can plot **gas ratios**, including the **Wetness-Balance Ratio; Wetness (Wh), Balance (Bh) and Character (Ch)**. The curves are plotted by using the appropriate equations for each of the ratios with the gas data in the file. Please remember these ratios are only as good as the gas data that has been acquired and how it was acquired. Parameters such as temperature, filament drift and gas flow amongst others, can all have an influence on gas readings and hence affect the ratios.

$$Wh = \left( \frac{C2 + C3 + C4 + C5}{C1 + C2 + C3 + C4 + C5} \right) \times 100$$

$$Bh = \frac{C1 + C2}{C3 + C4 + C5}$$

$$Ch = \frac{C4 + C5}{C3}$$

### AAPG Short Course Program - E&P Methods and Technologies

Balance Ratio	Wetness Ratio	Reservoir Fluid and Production Potential
> 100		Very light, dry gas Typically non-associated and non-productive such as the occurrence of high pressured methane, metagenic cracking below the oil window, bacterial methane etc
< 100	< 0.5	Possible production of light, dry gas
Wh < Bh < 100	0.5 – 17.5	Productive gas, increasing in wetness as the curves are closer together
< Wh	0.5 – 17.5	Productive, very wet gas or condensate or high gravity oil with high GOR (Bh<Wh indicates liquid, but Wh still indicates gas)
< Wh	17.5 – 40	Productive oil with decreasing gravity as the curve separation increases
<< Wh	17.5 – 40	Lower production potential of low gravity, low gas saturation oil
	> 40	Very low gravity or residual oil

Table 1 Fluid characterization using the wetness and balance ratios

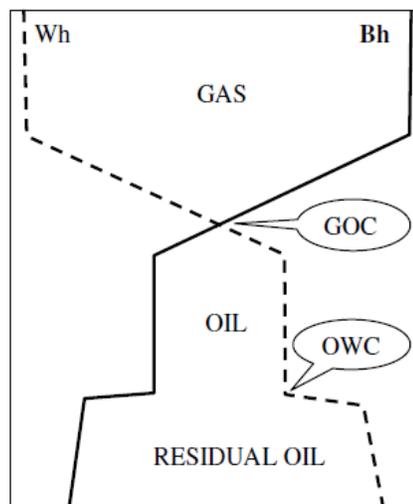


Figure 1 Typical fluid and contact profiles of the Wh and Bh ratios

If the wetness ratio is greater than the balance ratio, oil is being predicted. The closer the curves are to each other, then the lighter the oil. The greater the separation of the curves, then the heavier the oil and the more likely it is to be unproductive or residual.

The gas-oil-contact (GOC) is therefore defined by the cross-over point of the two curves.

The oil-water-contact (OWC) is typically determined when a sharp increase in the wetness ratio, accompanied by a greater separation of the two curves, reflects a greater proportion of heavier hydrocarbons associated with residual oil traces.

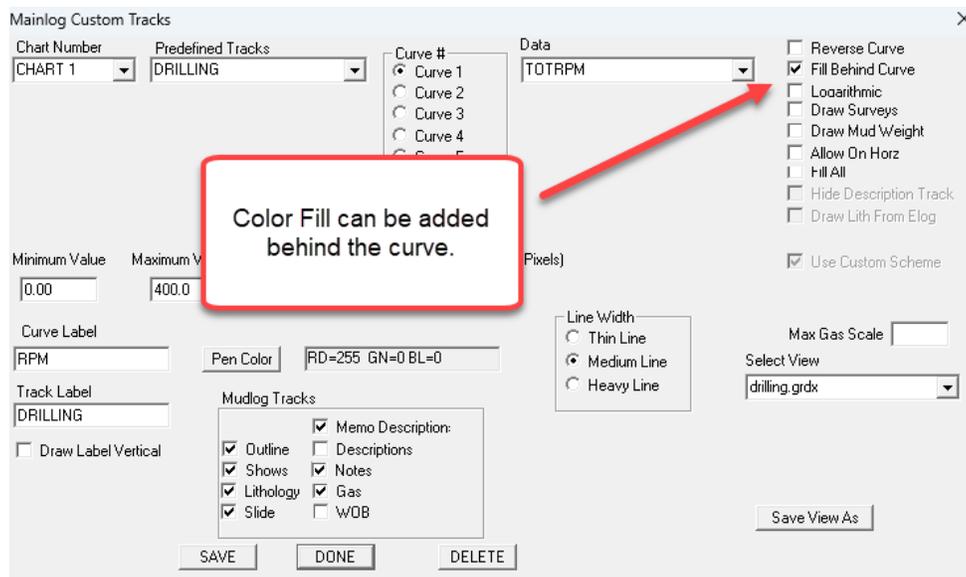
#### Character Ratio (Ch)

By comparing the heavier compounds (propane – pentane), the character ratio is used to qualify a gas prediction from the wetness/balance ratios. The character ratio confirms whether a gas prediction is indeed a gas zone, or whether the gas is associated with oil. The significance of comparing these three compounds is that C3 will typically be more predominant in a gas reservoir, with lower amounts of

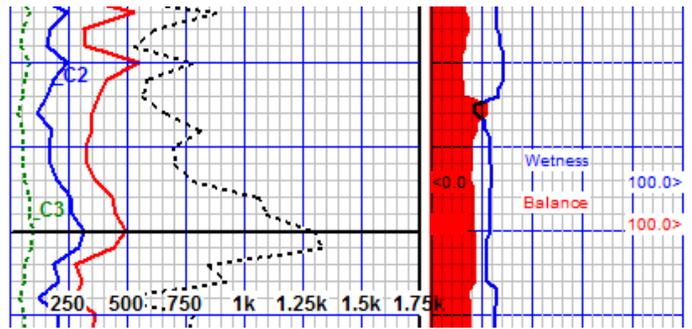
Also available is the “**Common Oil Indicator**” which uses the ratio of  $C3+C4+C5/C1$  and can be plotted on Custom Tracks.

**\*\*\* Since the all the ratios are calculated from the gas readings, any of the curves can be plotted from the office version by just turning on Custom Tracks and selecting the ratios.**

When Custom Tracks is enabled MainLog will add a default custom grid to the right of the gas grid and compress the width of the log to allow room for the additional grid. **Right clicking** on the custom grid will bring up a dialog that allows you to customize both the grid itself, by changing the number of blocks, or the block width, or adding a second grid. Scaling, Labeling, Pen Color, Fill Behind Curve and Line Width can be customized. There is no limit as to the width of the tracks, however, there are limits to the width that Mainlog can print and if they are too wide, they may not fit or appear correctly on paper that is only 8.5” wide.



Again, you can select up to 8 different data sets on each grid, set the scaling, pen color, color fill behind the curve and other options.



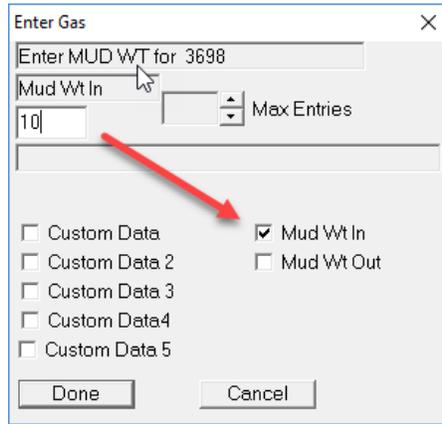
Many of the data sets **will only be available if you have a WITS feed that provides the data, such as WOB, RPM, SPM etc.** The gases, ROP, flare can all be tracked if available on the log. Additional options will become available over time; your input is always appreciated. Much of the data can also be imported from a LAS file provided by Pason, Totco or whoever is doing the rig monitoring on the well.

**D-Exponent Corrected (DXC)** can also be displayed on custom tracks. For this to work the “Lag Calculator” must be properly filled out. D-Exponent uses the following information in its calculation.

- Rate of Penetration
- Rotary drilling speed (RPM - including down hole motor)
- Weight on bit
- Bit Diameter
- Mud Weight

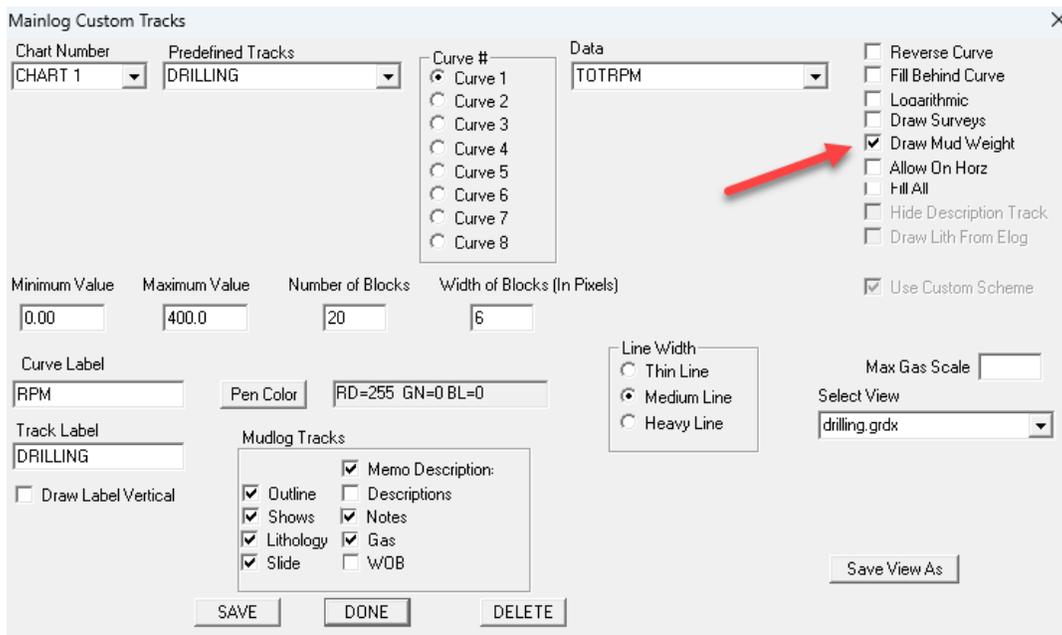
DXC needs an incoming WITS feed with RPM, and when using a down hole motor; “**Motor Rev/Gal**” must also be known and manually entered in the Lag Calculator.

Loggers must manually keep up with the **Mud Weight** and enter it on the log. To enter in mud weight (In or Out), double click or Ctrl + double click in the gas column at the depth desired, (just as if you were going to edit or enter in gas readings). Here you have the option to select “**Mud Wt Out or Mud Wt In**” and once checked you can manually enter in mud weight. (Use arrow key to scroll down depth)

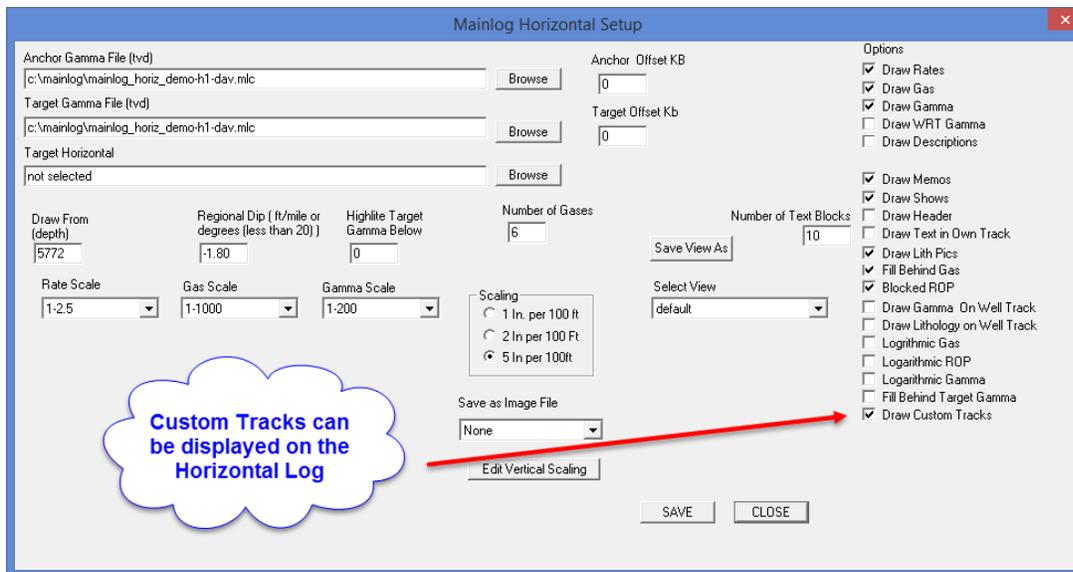
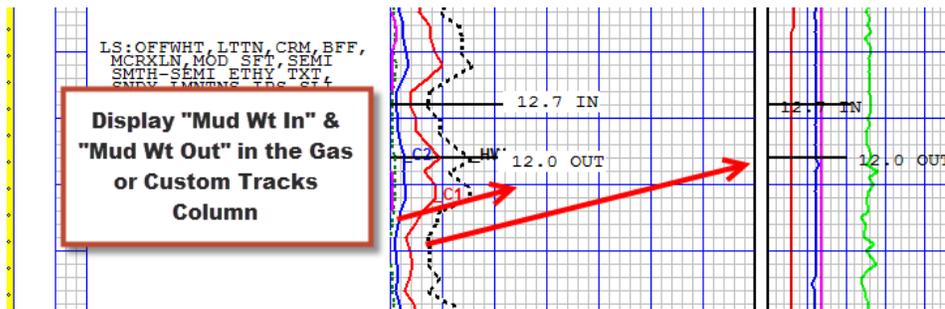
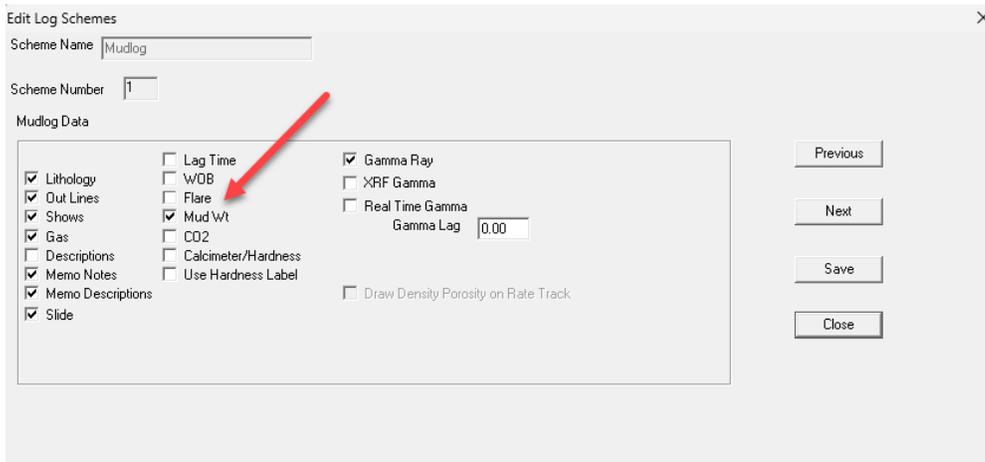


Enter the mud weight at the depth and MainLog will continue to use that in the calculation for D-Exponent until a different mud weight is entered in at a different depth.

**Mud Wt Out** can be displayed on any custom track by checking the box “**Draw Mud Weight**” from the Custom Tracks menu. Mud Wt In and Out will also be included in the LAS file.



Alternately it can be turned on by going to “**Scheme’s\Edit**” and check “**Mud Wt**” under **Mudlog Data**. In this case mud weight is displayed in the gas column.

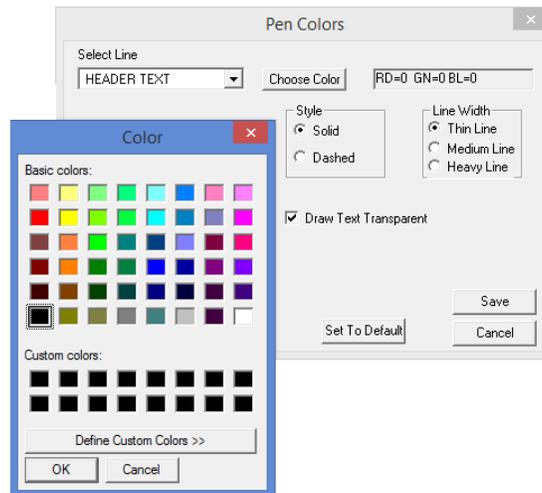
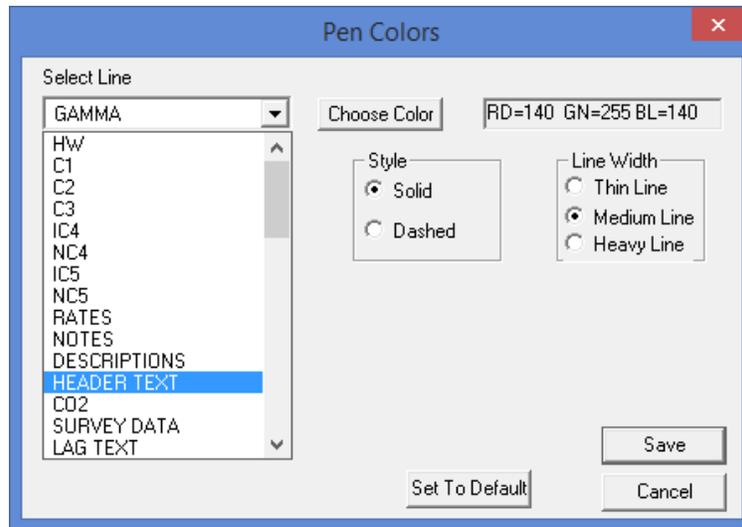


## Log and Lithology Colors (Also available in Office mode)

From the dialog, under “**Select Line**”, choose the item that you want to change the color of, and then click on “**Choose Color**” to pick the color. **Custom Lithology** colors can also be made. Next select what **Style** and **Line Width** you want and

remember to click “Save”.

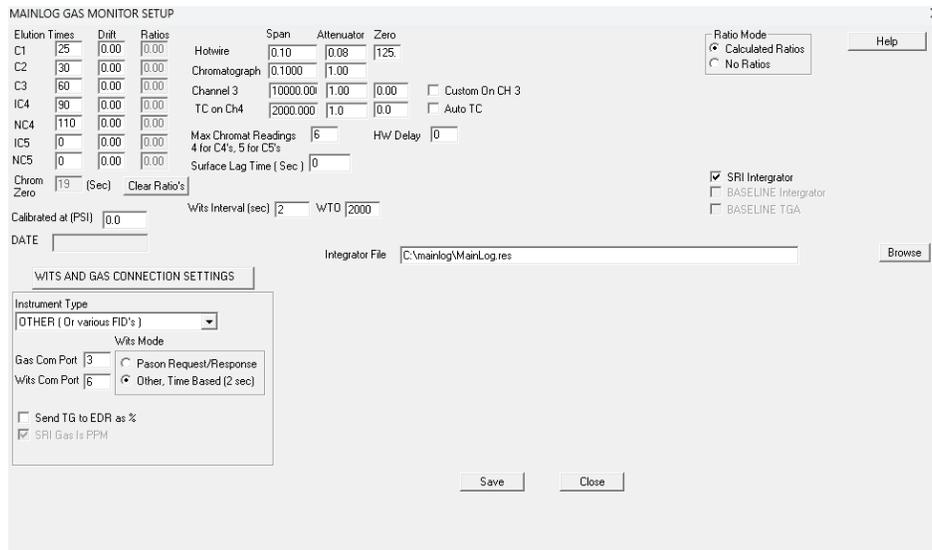
There are many different items on the log that the line color or text can be changed, including the on screen “Header Text” and “Header Background”. Browse through drop down list under Pen Colors to see the available items.



Colors chosen on the vertical will also be displayed on the horizontal log, however, certain items can be changed so they are different from the vertical display. They include Horizontal Gas Fill, Horizontal Target, Horizontal Descriptions and Horizontal Notes. See [Setup Colors \(Horizontal\)](#).

## Gas Monitor and Wits Setup

The Gas Monitor and Wits Setup dialog is where the type of Gas Instrumentation, Wits Mode's and Com Ports are selected. Depending on the **Instrument Type** chosen, certain options may or may not be enabled. Select your gas instrument in the **I** for specific settings for that instrument type.



When enabled, **OPTIONS...Gas Monitor**, and properly setup **SETUP...Gas Monitor**. MainLog will monitor gases in one of two possible modes.

**Mode 1: No Ratio's** will use actual chromatograph and hotwire readings, and log zero's if there is no reading available for the lagged interval. How well this works depends on the cycle time of the chromatograph, and the ROP. If drilling 30 seconds a foot, and you have a 4-min cycle time, you will not have readings for every 2 ft lagged interval. When these conditions occur, you should log using **Calculated Ratio's**.

**Mode 2, Calculated Ratio's ...**

**Calculated Ratios are done in two different ways.**

### **Example 1**

Used by request for select clients, and the default when using **BASELINE FID/TGA**, uses sample **HW/TGA**.

For this purpose, assume the HW/TGA reading is 300 (at the time the GC samples).

Actual GC readings on the Real-time chart/or Baseline “results file”.

C1 = 100

C2 = 50

C3 = 30

IC4 = 10

NC4 = 15

**Ratio’s created by dividing each gas by the “sample HW/TGA”.**

100/300 = .33% C1

50/300 = .16 % C2

30/300 = .10 % C3

10/300 = .03% IC4

15/300 = .05% NC4

Highest HW reading encountered in 2 ft lagged interval = 400 (this is what will be plotted on the log)

**Chromatograph values plotted on the log** are the ratio’s times the highest HW/TGA reading.

400\*.33 = 132 units C1

400\*.16 = 64 units C2

400\*.10 = 40 units C3

400\*.03 = 12 units IC4

400\*.05 = 20 units NC4

**Total chromatograph values add up to 268...does not equal the 400 units plotted by sample HW/TGA.**

**In this scenario the component gases may not total up to what the HW/TG WITS value is being plotted on the log.**

.....

### **Example 2**

Used by the vast majority of MainLog Clients, **EXCLUDING Baseline GC/TGA systems.**

**Uses total GC to create ratios.**

Actual GC readings on real-time gas chart/WITS feed.

C1 = 100

C2 = 50

C3 = 30

IC4 = 10

NC4 = 15

Total GC...100+50+30+10+15 = 205

### Ratio's created by dividing each gas by the total GC

100/205 = .49% C1

50/205 = .24 % C2

30/205 = .15% C3

10/205 = .05% IC4

15/205 = .07% NC4

Highest HW reading encountered in 2 ft interval = 400 **plotted on the log.**

Chromatograph values plotted on the log are the ratio's times the highest HW/TGA reading.

400\*.49 = 196 units C1

400\*.24 = 96 units C2

400\*.15 = 60 units C3

400\*.05 = 20 units IC4

400\*.07 = 28 units NC4

**Total adds up to 400...**equals the 400 units plotted by sample HW/TG WITS value.

**In this scenario the component gases will always total up to what the HW/TG WITS value being plotted on the log.**

Once the ratios are set by either method, they will be used by multiplying the highest Hotwire reading within the 2-foot lagged interval by the ratio for each gas. Gases are logged to a two-foot interval and updated on screen on even feet only.

### Instruments w/Data Acquisition

#### Analytical – Blue Ray - DAQ

Instruments where MainLog does the data acquisition through an interface called a “Modbus” by Acromag, which takes an analog signal and changes it to a digital signal, are Analytical, Blue Ray, Series 2000 and certain DAQ gas detectors. When any of these are chosen, Elution times, Cycle Time, Span's, and other

settings in the Gas Monitor Setup must be set up. Pages 108-114 covers these items.

## Elution Times

Enter the elution time for each gas **peak**. Readings will start being taken 3 sec. before the time entered until 3 sec. after the peak. The highest reading in the 6-sec. interval will be used for each gas. If the elution times are off by more than a few sec. The readings will not be accurate.

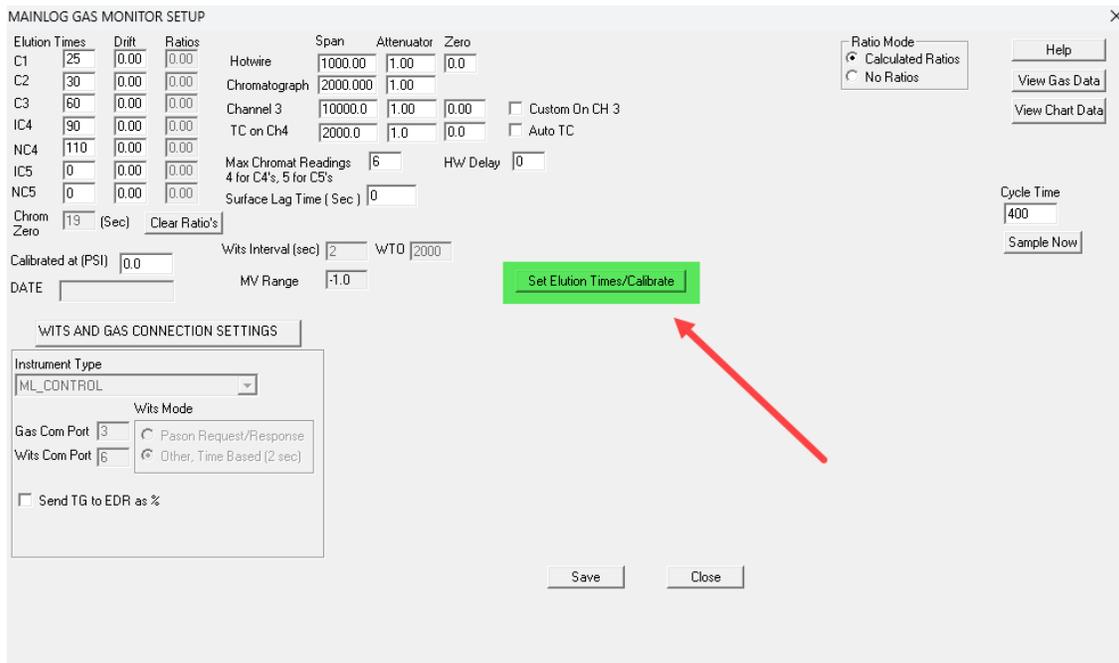
Hotwire readings are taken every second; the highest reading within a 2-foot lagged interval will be used. Gases are logged to a two-foot interval and updated on screen on even feet only.

There will be some differences in setup and function from one instrument type to another, Series 2000, Analytical, DAQ, Midland Instruments, Blue Ray, Baseline TGA, etc. The instruments must be operating correctly and have a reasonable zero baseline for the Gas Monitor system to work well.

The software will “read” a chromatograph zero point at the elution time entered for **chromatograph zero**. This value will be subtracted from all readings to help compensate for **MINOR** drift from cycle to cycle. Where in the cycle you set, this will depend on the characteristics of the chromatograph you are using. If set incorrectly, the chromatograph readings will be too low or too high. Some experimentation with this setting will be required.

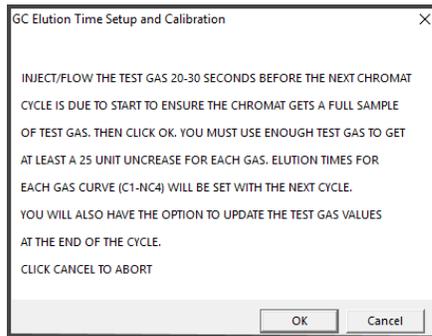
## Setting Elution Times and Instrument Calibration

Elution times are the number of seconds from the injection kick to the peak of each gas. The program will look for and record the highest reading within 3 seconds of either side of the elution time for each gas. For example, if your C1 elution time is set at 20 seconds, the program will look for the highest reading between 17 and 23 seconds. **It is very important that there is no overlap between the elution times.** In other words, if the elution time for C1 is 20 seconds, then the elution time for C2 should not be less than 27 seconds. The program will be looking for the highest peak for C1 from 17 to 23 seconds and then look for the highest peak for C2 from 24 to 30 seconds. There is no overlap.

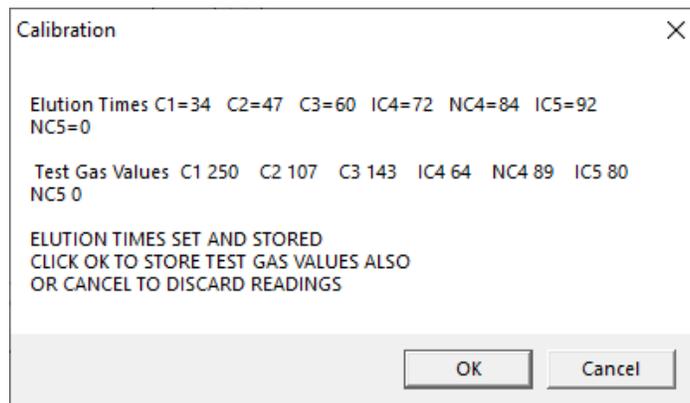


When the **Instrument Type** chosen uses an Acromag (Modbus) for reading gases, by a CC and/or TC filament, elution times can either be set manually or have MainLog set them. The following procedure should be done with MainLog setting the times:

1. The **“Set Elution Times/Calibrate”** feature covers C1-NC5 with seven-part test gas. If seven-part test gas is not available, C5 elution times will have to be entered manually.
2. Make sure the Chromatograph is reading **positive millivolts** & the column pressure is set properly for your equipment. Column pressure has a direct impact on elution times, so make sure it is steady.
3. The **“Chromatograph Span”** is the sensitivity adjustment, the higher the span, the higher the gas reading. It will likely have to be adjusted so that the calibration values that are desired with test gas meet your requirements. For setting elution times, the value entered needs to be high enough to see the component gas readings at least 25 units or more. **(1000 is a good initial span setting if unfamiliar with the instrument)**
4. The **“Cycle Time”** needs to be long enough to read C1 through NC4 or NC5 depending on your equipment.
5. The **“Attenuation”** should match the instrument attenuation if it is being used. If it is not being used on the equipment, then leave it at **1**.
6. **Ratio Mode** set to **Calculated Ratio’s**.
7. Have the test gas flowing to the instrument prior to the chromatograph taking a new injection (about 30 seconds) click, **“Set Elution Times/Calibrate”**. A dialog opens with instructions.



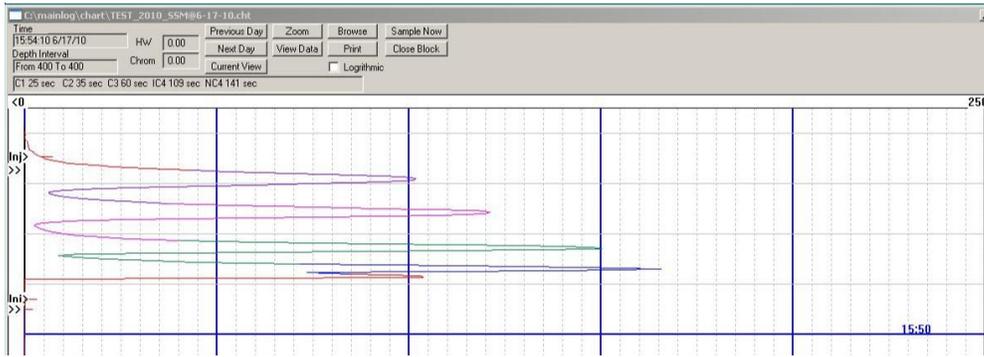
When the cycle is complete the following dialog opens.



After the cycle is completed, the elution times will automatically be stored. The **Chromatograph Zero** will be set to 80% of the C1 elution time (**in seconds**) and becomes the established baseline. **Chrom Zero** is the number of seconds from the injection kick to what MainLog will use as the actual zero baseline for each chromatogram.

After clicking **OK**, MainLog will populate the Test Gas Values in the Setup\Test Gas Values dialog which are needed if logging gases in percent. MainLog assumes that the span was set correctly, and calibrations are correct. If they are not, adjust the span and re-run the “Set Elution Times” feature until they are calibrated properly. Once calibrated it is recommended to confirm the test gas values in the Test Gas dialog if you click cancel, the test gas values will be discarded, but the elution times will still be used. If they are incorrect, repeat the procedure.

The Real-Time Gas Chart will show the gases and each gas curve will be the color selected on the log. If the elution times are properly set, the entire peak of each gas will be represented by its color as shown below.



**Calibrated at (PSI):** The person calibrating the instrument can manually enter in the column pressure. The amount of pressure on the column will affect elution times, so it's a way document what the column pressure was during the calibration.

### Manually Set Elution Times

To manually set the elution times, follow steps 1-7 above. Next, flow the test gas and on the subsequent injection watch the **Cycle Time Clock** and record the time of each peak gas as they come up. When the cycle is completed manually enter the elution times in the Gas Monitor Setup dialog.

MAINLOG GAS MONITOR									
HW	C1	C2	C3	IC4	Nc4	IC5	NC5	Index	CycleTime
0	76	135	168	43	0	0	0	5	94
Chrom=X 1.0, HW=X 1.0 HWmU=1.50 CHmU=5654.50 7									

When using **percent gases** on the log, then you will need to manually enter the Test Gas Values in the Test Gas Value dialog.

**Note:** “**Max Gases**” in the **Gas Monitor Setup** represents the number of gases that will be read and plotted on the log, but when using the **Set Elution Time/Calibrate** feature, it does not come into play.

### Drift

Filament drift of more than one or two chart divisions will seriously detract from the accuracy of the readings. To help compensate additionally for drift, a drift value for each gas, C1-C5 can be entered. This value should reflect chart divisions of drift multiplied by the current attenuator, i.e., 1 div of drift, with the attenuator at x5= a drift value of 5, not 1.

### Hotwire Delay

This value represents the time it takes for the gas sample to move from the hotwire to the chromatograph. (Or in some cases from the chromatograph to the hotwire) This value is critical for the ratios to calculate on the correct hotwire reading. Again, some trial and error will be involved in determining this best place for this setting. A **SAMPLE HOT WIRE READING (SHW)** will be taken the number of hotwire delay seconds after the chromatograph samples.

If the hotwire and chromatograph sample at the same time this value should be at or near zero. If the sample flow is from the hotwire then to the chromatograph, the number entered will be subtracted from the total cycle time to read the sample hotwire before the chromatograph samples.

An Example....

Assume a total cycle time of 4 min, or 240 sec. If the HW Delay is set to 230, the SHW will be read 10 seconds before the chromatograph shifts. If the HW Delay is set to 200, the SHW will be read 40 seconds before the chromatograph shifts. Etc.

Ratios will be calculated on the Sample Hot Wire (SHW) or Total Chromatograph. (TOTCHROM)

I.E. Actual readings.

$$\text{SHW}=100$$

$$\text{C1}=80$$

$$\text{C2}=50$$

$$\text{C3}=25$$

$$\text{C1 ratio}=\text{C1}/\text{SHW}=.80$$

$$\text{C2 ratio}=\text{C2}/\text{SHW}=.50$$

$$\text{C3ratio}=\text{C3}/\text{SHW}=.25$$

Assuming a MAX HW reading of 200, the chromatograph gases will be calculated as follows:

$$\text{C1}=\text{Max HW} \times \text{C1 ratio}=200 \times .80=160$$

$$\text{C2}=\text{Max HW} \times \text{C2 ratio}=200 \times .50=100$$

$$\text{C3}=\text{Max HW} \times \text{C3 ratio}=200 \times .25=50$$

## Span

The Span is used in the gas calibration of certain instruments. It acts like a sensitivity pot to get the correct reading with test gas.

## Attenuator

The attenuator may be used when diluting a gas sample with air.

## Zero

When using an Acromag (Modbus), on a gas instrument, a value can be put in to “zero” the Hotwire on the MainLog Chart Recorder. Simply subtracts the number entered from the actual reading.

**Channel 3 – Custom On CH 3** - This channel on the **Acromag** can be used for reading CO2 or any MV input in the same MV range as other inputs. Value will be stored in the Custom item, and can be plotted in custom tracks, and saved to an las file.

**Channel 4 - TC on Ch4 – Auto TC** –on the Acromag, Channel 4 always used for reading a TC filament. When using a Blue Ray or ML Control instrument, and AUTO TC is available and enabled, when the TC reading is higher than the CC filament, MainLog will use the TC reading. How the filaments are zeroed will affect exactly where the crossover occurs. For some clients, the TC reading will be used whenever it is higher than 350 units

## Max Gas Readings

This represents the number of component gases that will be read and plotted on the mudlog. If you are drilling in an area where there is only Methane and Ethane there is no reason to read all the gases, so this could be set to 2. This will allow for shorter cycle times and hence more readings on the chromatograph.

## Com Ports (for reading instruments & WITS feeds)

For MainLog to acquire data from instruments and/or a WITS feed, Com Ports must be available on the computer. Today, most computers no longer are made with 9 pin serial ports, only USB ports. Because of this a [USB to Serial adapter](#) must be used. (MainLog recommends a “USB to Serial Adapter” made by *Triplite Keyspan*) If using this brand, the drivers must be installed before plugging the adapter into the computer.

After plugging the adapters in, to find out what com port the adapters are on, go to “**Control Panel**” then “**Systems**”, then “**Device Manager**”. Look for the device, “**Ports**” with a “+” sign next to it. Click on the + sign and you will see what com ports the adapter(s) are on.

Go to **Set-up/Gas Monitor Setup** and enter in the com port numbers for you **Gas Monitor** and **WITS feeds**.

### **Surface Lag Time – (Can be entered if a By-Pass Valve is not being used)**

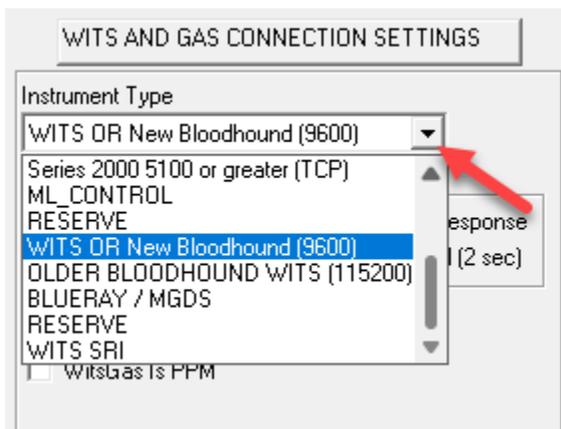
Gas instruments continue to read gas that is in the sample line after the pumps shut down. In the **Gas Monitor Setup**, there is an option to add a “**Surface Lag Time**” to capture gas readings after the pumps have shut down. Depending on how far the instruments are from the trap, this could be several minutes, and gas readings can be exhausted out during that downtime without being plotted to the log.

When a “**Surface Lag Time**” is entered, MainLog will continue to read the gas coming into the instrument for that period and place it in a “**buffer**”. Once the rig pumps are turned back on, the gas data stored in the buffer will be used rather than the "AIR" that is in the gas line. This will improve lag accuracy, especially when the trap is far from the trailer, and ROP is fast. Once the surface lag time is met, MainLog will resume reading gas as normal.

It is the logger’s responsibility to calculate how many seconds it takes for the gas to go from the trap to the instruments. The Surface Lag Time, **in seconds**, is entered in the Gas Monitor Setup.

### **Wits and Gas Connection Settings**

**Instrument Type** – MainLog connects to various instruments. From the down arrow you can select the gas Instrument Type or select, WITS OR New Bloodhound (9600), if that is how the instrument sends the results/data.



**Gas Com Port** - If you are using an instrument such as Analytical, Blue Ray or

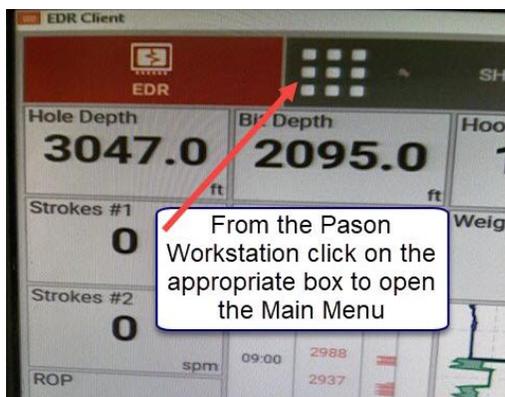
ML Control, you will have a gas com port to enter. From Device Manager on your computer, you can see what com ports are available. See **Device Manager**.

**\*\*Note: If the instrument type is sending the gases via a Wits feed, you do not have to select a gas com port. You only select a Wits com port since the data is being sent via Wits.**

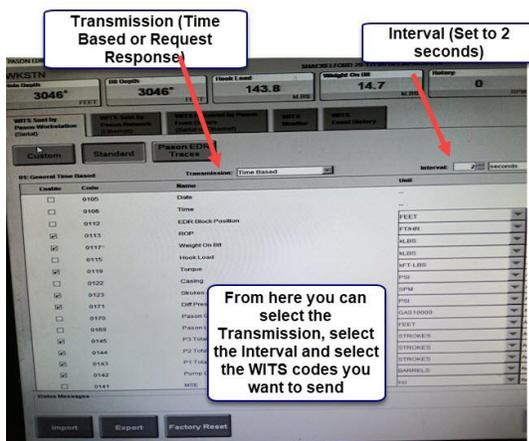
**Wits Com Port** - Enter in the com port for you incoming Wits feed, either from the EDR or in some cases from the gas instruments, such as Terra SLS or Bloodhound which send both drilling and gas data. From Device Manger on your computer, you can see what com ports are available.

### **Pason Workstation**

As of December 2024, Pason updated their software and accessing WITS on their workstation has changed. From the Workstation click on the appropriate square on the upper left side of the screen to open the **Main Menu**.



From the **Main Menu** click on **Equipment**, then **WITS**. From here you will be able to select the **Transmission**, **Interval** and what **WITS** codes to send. Only send WITS codes that start with 01 unless you are using Pason Gas.



## Wits Mode

- **Pason Request/Response** - If the EDR provider is Pason and the “**Transmission**” on the Pason Workstation is set to **Request Response**, then check this box. On the workstation the Request Response should be set at 2 seconds.
- **Other, Time Based (2 seconds)** – Select this mode if the EDR provider is not Pason or if the instrument is sending data via Wits. **Note: this can be selected for Pason only if from the Pason Workstation the “Transmission” is set to Time Base at 2 second intervals.**
- **Send TG to EDR as %** - When checked MainLog will send the Total Gas value to the EDR as a percentage. Tip...if the EDR is not reading your Total gas try checking this box.
- **Wits Gas is PPM** – If the gas being sent to MainLog is in PPM, check this box.

## Alarms

Various alarms can be set in this dialog including a drilling break alarm, a time, a depth, or even long foot. Alarms can also be set for high and low gas if using the gas monitor system. In the Alarm Setup the **Lag Alarm Interval** can be set to any amount of feet you want. (i.e., 10’, 20’, 50’, 100’, etc.) Set to zero (0) turns it off.

In the Alarms dialog various **WITS Alarms** can be set as well, including WITS Percent, Flow, Pit Volume, and Casing Pressure.

Alarm Setup

Drilling Break: 0.0 MIN/FT

Number of feet: 0

Depth: 0

Time: 1:00

Long Foot: 0.0

Low Gas Units: 0

High Gas: 0

Lag Alarm Interval (0 to Turn off): 10

Lag Depth: 0

Wits Percent: 0

Wits Bit Depth: 0.00

WITS Alarms: Wits Gamma, Torque, PP, RPM, SPM 1, SPM 2, SPM 3

Min: 0.0, Max: 0.0, Time (Minutes): 0.0

Notify By Email:

SAVE Cancel

**Set the "Lag Alarm" interval to the amount of feet required**

**Drilling break alarm:** First, set the ROP under *Drilling break*, by either setting the cursor inside the text box or by clicking inside it, then erasing the number, or setting a new ROP. Then select how many feet in the same manner.

**Depth:** To set you alarm for a depth, enter the depth inside the text box under depth.

**Time:** To set your alarm for a time, enter the depth inside the dialog box under Time. Enter in a standard time (not military time), and if it is PM, check the box next to PM. If this box is not checked, the computer will assume that it is AM.

**Important: this alarm works off the computers clock; be sure the time is correct on your computer!**

**Long foot:** To set the alarm for a long foot, enter the ROP inside the text box.

You may want to test the alarm by clicking the <Test> button. You must have speakers and a wave file for the alarm feature to be useful to you. Once you have set your options, press <OK>.

## Lag Calculator

A theoretical lag can be calculated by entering the specific drilling parameters when a WITS feed is not coming in. With a WITS feed from the EDR, lag can be calculated using strokes if all the proper information is entered in correctly. Even down hole motors can be figured in.

The screenshot shows the 'MAINLOG LAG CALCULATOR' window with the following data and controls:

- Current Depth:** 9568
- Metric:**
- Dimensions:** Casing (8.750), Liner 1 (0.000), Liner 2 (0.000), Open Hole (8.500)
- DC-1, DC-2, DC-3, DP-1, DP-2:** Values for diameters and lengths.
- Hydrostatic Pressure:** 4776.35
- Matrix Stress:** 5118.88
- Formation Pressure:** 4449.12
- Bottom Hole Differential Pressure:** 327.23
- LAG TIME NOW Based On Current Wits SPM:** 34.46 at 170 SPM
- Strokes/Min, Bbls/Stroke, Efficiency:** Values for Pump 1, 2, and 3.
- Buttons:** Calculate, Save, Close, Clear BU Depth, Help.
- Checkboxes:** Pump 1 On Hole, Pump 2 On Hole, Pump 3 On Hole, Lag Using Strokes.

MainLog will adjust the “**Washout**” automatically, based on the “**Measured Lag Time**”, which will correct the “lag strokes”. When entering in a **Measured Time** in the lag calculator, which the logger should determine with carbide or other means, the calculated values will adjust to match the measured, so that the lag by strokes works correctly. The most likely reason the measured lag is more than calculated lag is due to washouts, and therefore it is always recommended to try and get a measured lag time and enter it in the lag calculator.

Alternatively, a washout can be entered manually, and the calculated lag will increase based on the percentage of the washout. When entering a washout, keep in mind that a value of 1.0 is 100%, 0.10 is 10% and .01 is 1%. When a value of ‘.1’ (10%) is entered and “**Calculate**” is clicked, the bit diameter in all calculations is increased by 10%. So, a 7.875-inch bit will increase by .7875 (7.875 X 0.1) and becomes an 8.6625-inch hole diameter for all volume calculations. A value of 1.0 (100%) will double the hole size to 15.75 inch. Hopefully it is not often needed, but not unusual in shallow sections where salt and shales are washed out severely. The actual bit diameter will always be displayed in the OPEN HOLE edit box.

The lag strokes will NOT increase by the % entered, only the diameter of the open hole. This will result in an increase in the lag strokes, which will vary by the number of feet of an open hole.

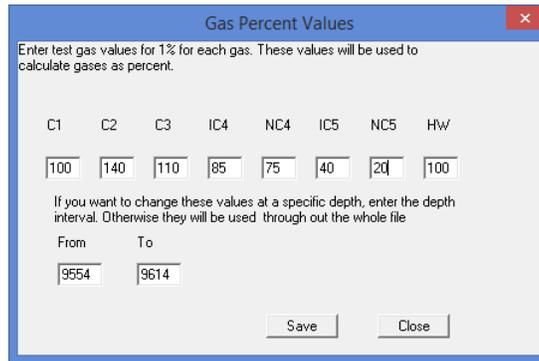
Keep in mind that even a value of 1.0, (100%) washout will have NO EFFECT on the lag after a casing run when no drilling below casing has happened. It applies only to the OPEN (uncased hole). See [Lag Using Strokes](#).

## Test Gas Values

**This menu must be used if gas readings are going to be plotted in percent.**

When calibrating, enter in the test gas values for 1% for each gas. These will be used to calculate and plot gases as percent. If these are not entered correctly, the values displayed will be incorrect.

**The HW value in the “Gas Percent Values” dialog is for reference use only unless the “TG as Percent” has been selected under Chromat Gas Mode, then use either 50 or 100 based on the 1% calibration being used.**



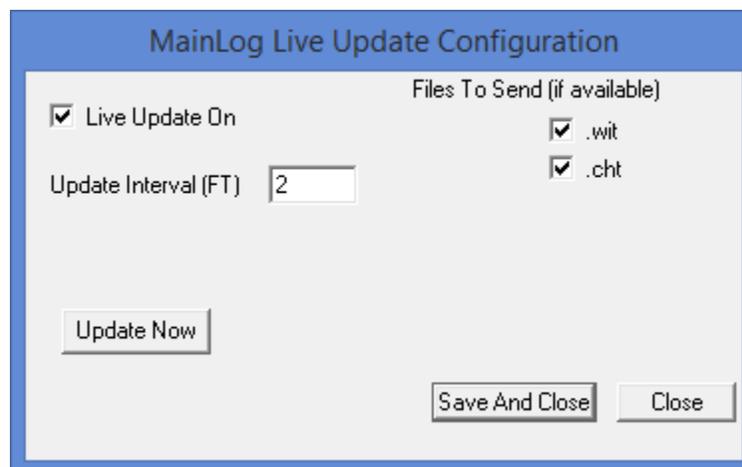
**When using an FID, the values for each gas should be 100 for 1% = 100 units.**

## Real Time Updates

For logging companies using DropBox feature, this menu is for turning on “real time updates” to the Dropbox folder. The logger has control over whether to send the WITS & chart files. The update interval is also controlled by the logger. Any files that are selected will be updated anytime the file changes.

It is the **logger’s responsibility** to invite and remove people from both the “Client ID xxx” and “ClientID XXX Chart” Dropbox folders located in the C:\mainlog directory on **every new well**. See **Setting up Clients with “Dropbox”** .

Note: when creating a new MainLog well the default is to **turn off** “Live Updates”. When creating a new well any files left in the Dropbox folders from the previous well will be deleted, **but it is still the logger’s responsibility to verify who will be sharing the folder**.



## The Horizontal Log

## General:

The horizontal log is simply a different view of the data. From a logging point of view, all data entry is done on the vertical log, except notes can be entered directly on the horizontal screen if desired. As surveys are entered in the Horizontal Data Menu and the inclination has reached 10 degrees, the horizontal log can then be accessed and viewed.

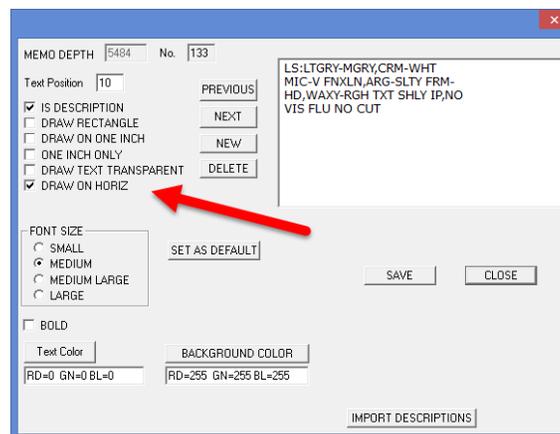
The “**View Horz**” and “**View Svy**” buttons will appear on the menu bar when the surveys reach 10 degrees.

## Horizontal Descriptions:

There are a few ways descriptions can be entered onto the Horizontal Log. One is by using a “~” (tilde) as the first character of a description on the vertical log which will cause that description to be displayed on the horizontal at the same measured depth. To remove the description, simply edit the description on the vertical log, and remove the tilde. The tilde (~) will show up in drilling mode, but not in office mode or when printing.

A second way is when using [Memos as Descriptions](#) on the vertical log, by right clicking on the memo you may select “**Draw on Horiz**” from the Memo Edit dialog for the description to be displayed on the horizontal log. A horizontal memo is limited to 500 characters.

**It is important to note that when a description, memo or short report is assigned to the Horizontal Log from the “Vertical Log” it becomes a “Horizontal Memo” on the horizontal log. The editing of that Horizontal Memo is then done from the Horizontal Log view.**

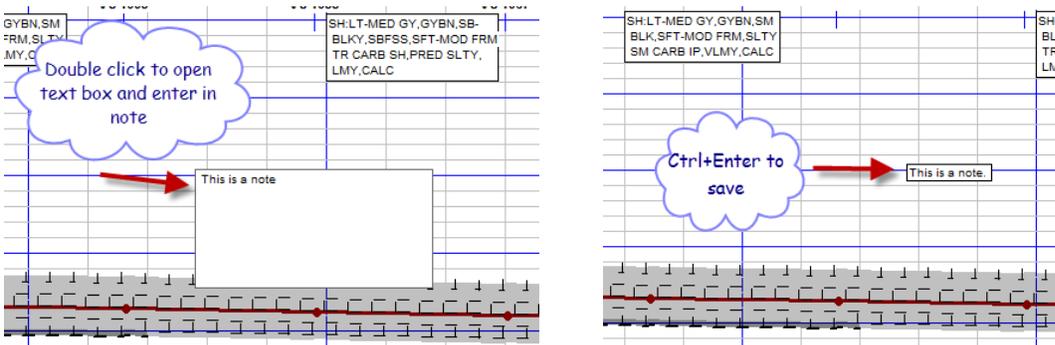


Once on the horizontal, by right clicking on the description, the edit dialog will open, and many options are available including text & background color.

A third way to enter a description on the Horizontal Log is to left double click on the horizontal to open a memo dialog and type in the description.

## Horizontal Memos

To add a horizontal memo, simply double click the position on the horizontal log where you want the memo to be. An edit rectangle will open for adding the memo. Press the **“Enter”** key to go to the next line before reaching the text box limit.



Press **“Control + Enter”** to save and close, **“Escape”** to abort. To move the memo, hold the control key down + press mouse button with cursor in the note rectangle and drag note to where you want it, then let go.



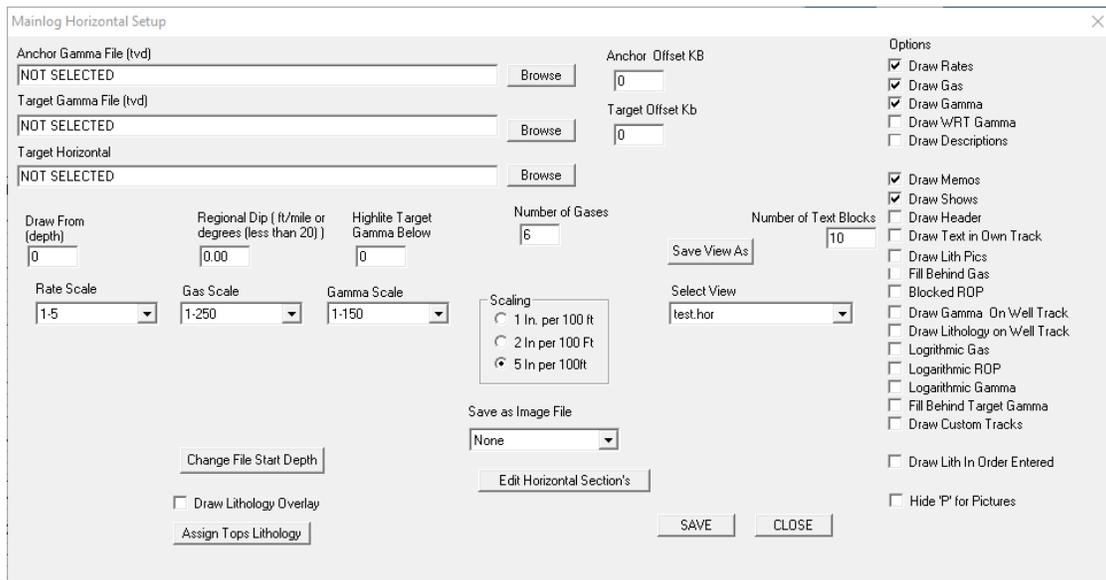
**To edit, double click on the rectangle or right click on the memo to open the memo dialog.** \*\* Memos entered on a five inch will only display on a five-inch view, same for one inch and two-inch view.

For those clients who have the “Copy and Paste” functionality, you can copy a description or memo description from the vertical log, a Word or text document, or

a PDF, and then paste it into the memo function on the horizontal. A logger may prefer to use this feature rather than the “~” feature to put descriptions on the log.

### \*Horizontal Options (Also available in Office mode)

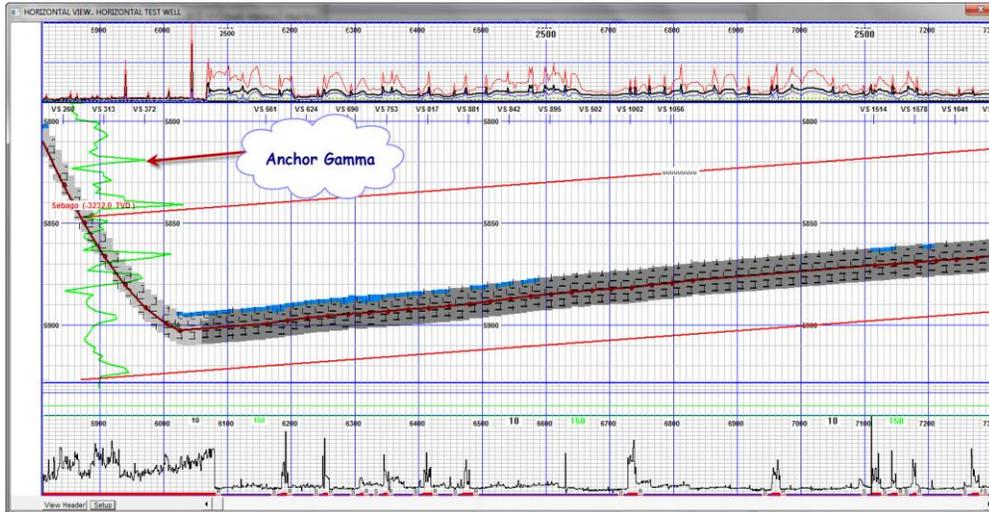
There are many options available to customize or accent different aspects of the horizontal display. Most will be left on, but it can be useful to turn off one data set to emphasize another. Some that make a very different impact are “Fill Behind Gas”, and “Draw Lithology On Well Track”. These options should allow you to create a custom view that is useful for your specific situation.



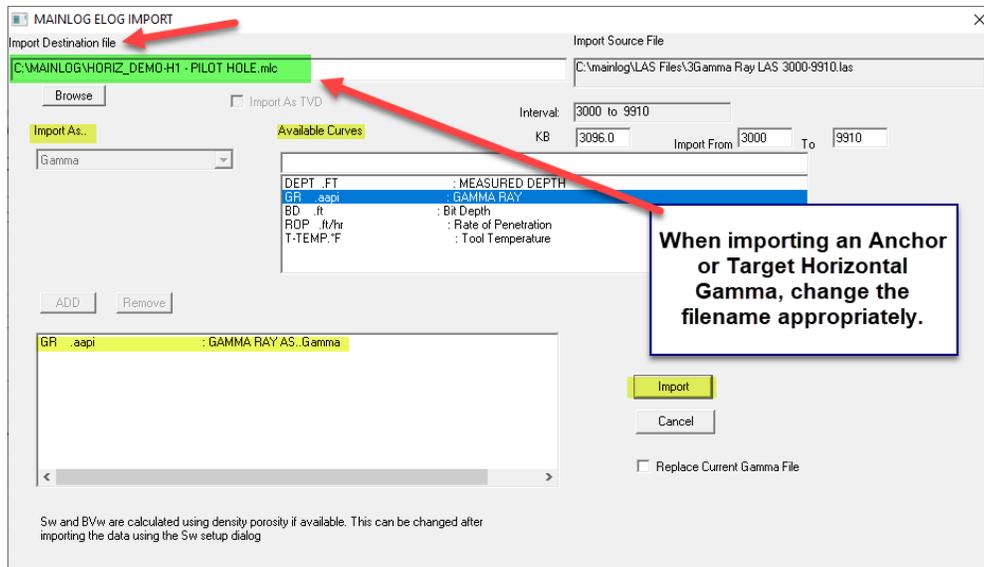
### \*Anchor Gamma (TVD): (Also available in Office mode)

Unless you have a TVD gamma from the original pilot hole, a TVD gamma from an offset well, or a TVD gamma from the current horizontal well, **you must not** use this feature for correlating. In other words, you **do not use the MWD “measured depth” gamma from the horizontal lateral, here!**

Typically, a gamma file imported into MainLog from the original bore hole, assuming a plug back situation, or possibly from a close by VERTICAL well bore. This will be display vertically on the left margin of the horizontal view.



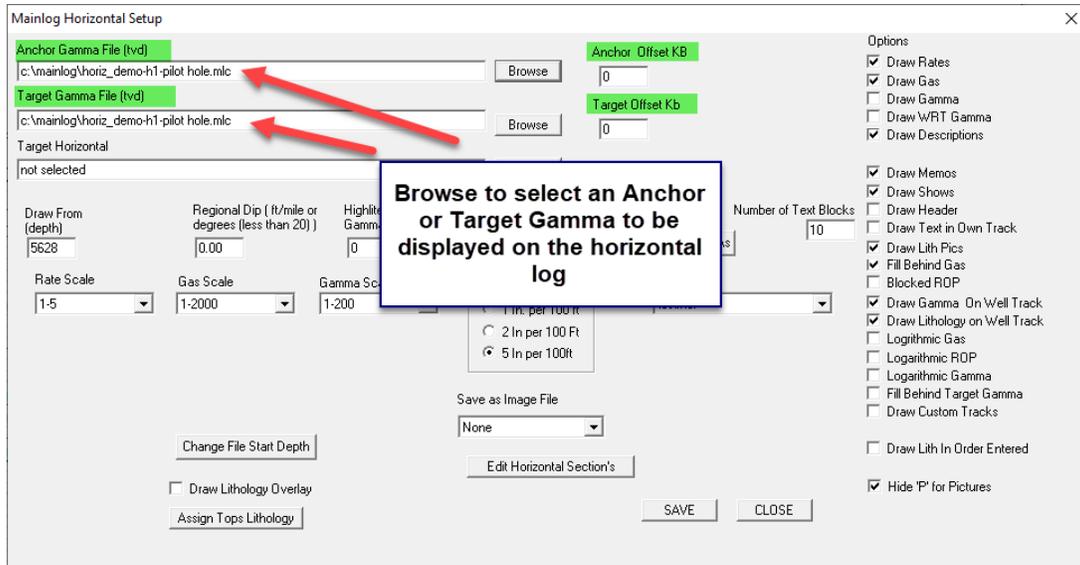
To display an Anchor Gamma or Target Gamma, import the Pilot Hole gamma or a nearby Vertical gamma by going to **Import\Import Elog Data**. Select the LAS file to import and from the ELog Import dialog, **first change the name of the file in the “Import Destination File” box**. Since most of the time MWD gammas are being imported, MainLog defaults the name of the curve file, to the filename of the well being drilled and uses a “. MLC” file extension. **Since the Anchor gamma is different than the MWD gamma, the name must be changed.**



After selecting **Gamma** in the **Available Curves**, **Import As** a **Gamma** and **Add** it to be imported. Click **Import**.

Next open **Setup\Horizontal Options** and “**Browse**” to the **c:\mainlog** folder to select the <filename>.mlc file you want to be displayed as the Anchor and Target

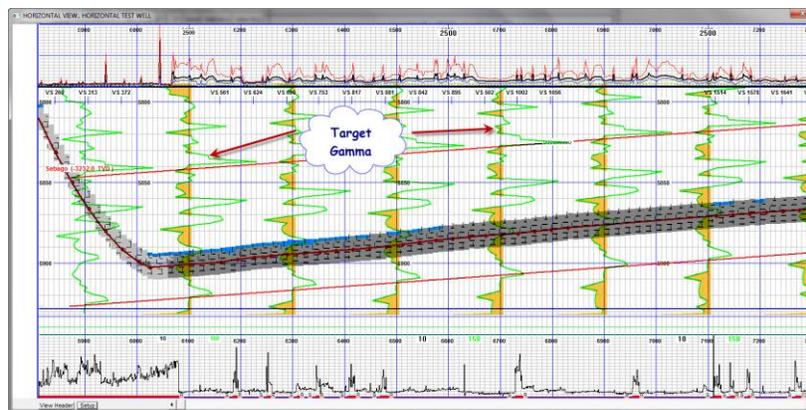
## Gamma Files on the horizontal log.



From the Horizontal Setup a KB **Anchor or Target Offset** can be entered if needed.

### **\*Target Gamma (TVD): (Also available in Office mode)**

This possibly can be the same mlc (gamma) file as the anchor gamma but displays vertically every 500 ft. across the measured depth portion of the log. See instructions above in Anchor Gamma on how to display.

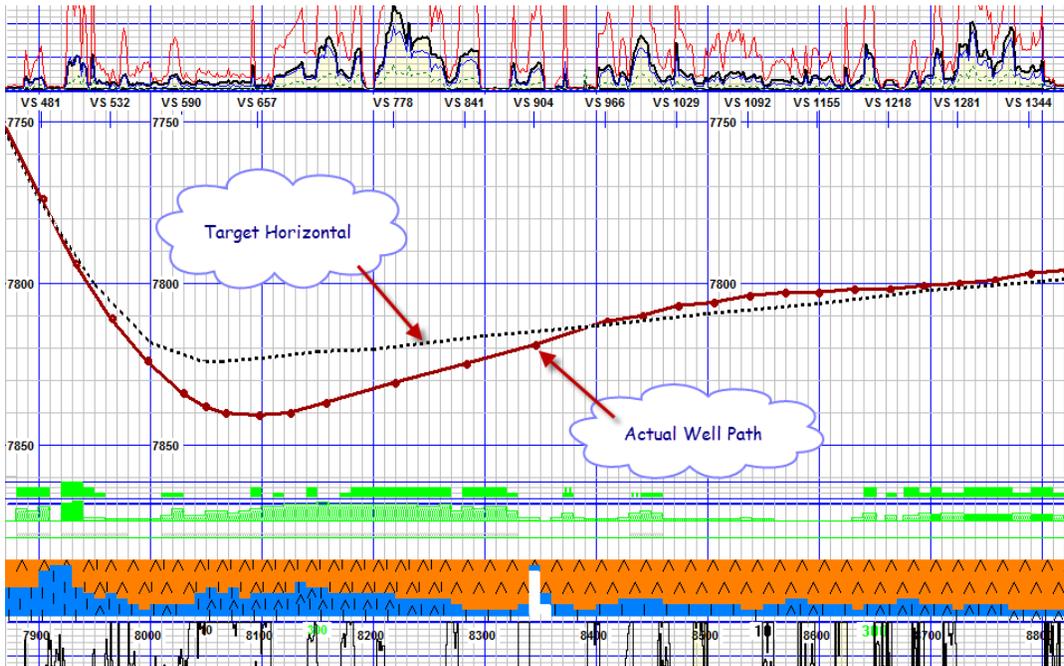


### **\*Target Horizontal**

Under **Setup**, “**Import Horizontal Target Data...**” can be selected to import a text file to display the proposed well path on the horizontal log. Below is the text format required for the import function to work. The first column is the Measured Depth (MD) with the associated True Vertical Depth (TVD) in the second column

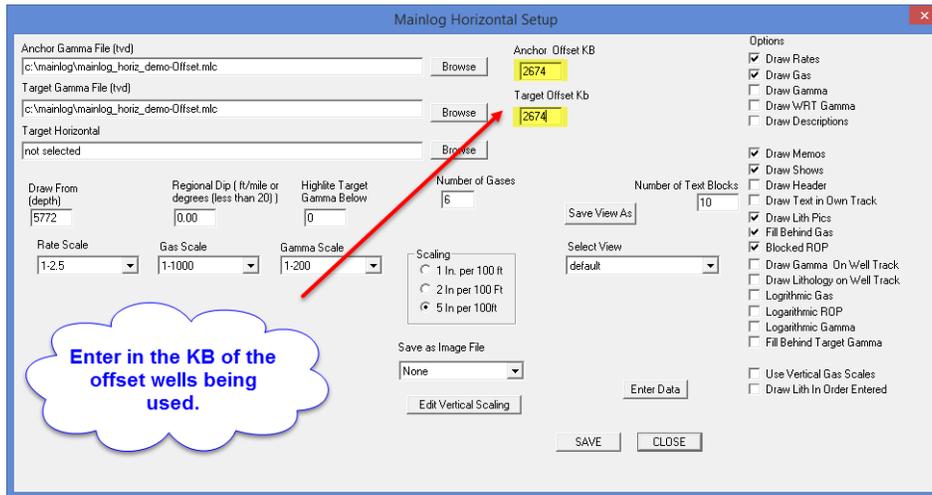
of the proposed well path. Once imported, MainLog creates a <filename>. trg file, which can be selected from the Horizontal Options Menu and then display the proposed well path along with the actual well path for comparison.

Depth (ft)	Value
94	93.99
190	189.98
280	279.97
373	372.97
467	466.97
559	558.96
652	651.93
871	870.89
962	961.88
1054	1053.86
1146	1145.85
1238	1237.84
1329	1328.83
1483	1482.82
1577	1576.81
1672	1671.8
1765	1764.79
1860	1859.78
1955	1954.77
2049	2048.76



**\*Anchor or Target Offset: (Also available in Office mode)**

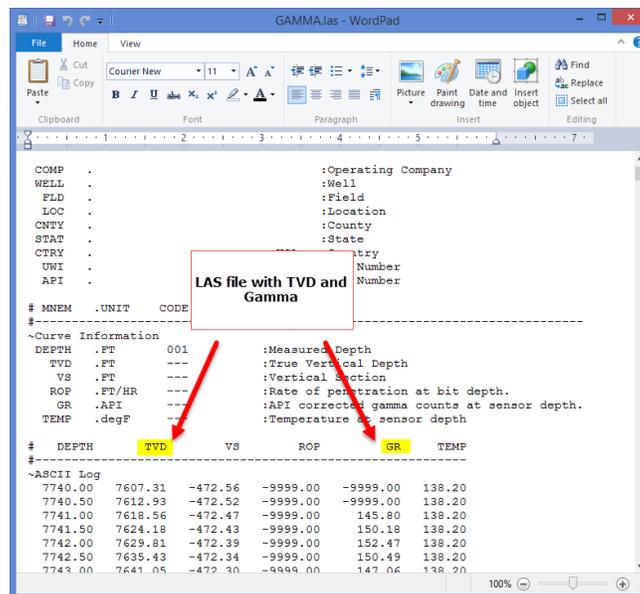
When offset gamma curves are used for an Anchor or Target gamma on the horizontal log, the KB of the offset well should be entered in and MainLog will adjust the curves accordingly. If zero is used, MainLog assumes the KB is the same as the current well and will not adjust the curves.



**\*Import Multiple TVD Gammas (Also available in Office mode)**

The ability to import and display **Multiple TVD Gamma** curves on the Horizontal Log.

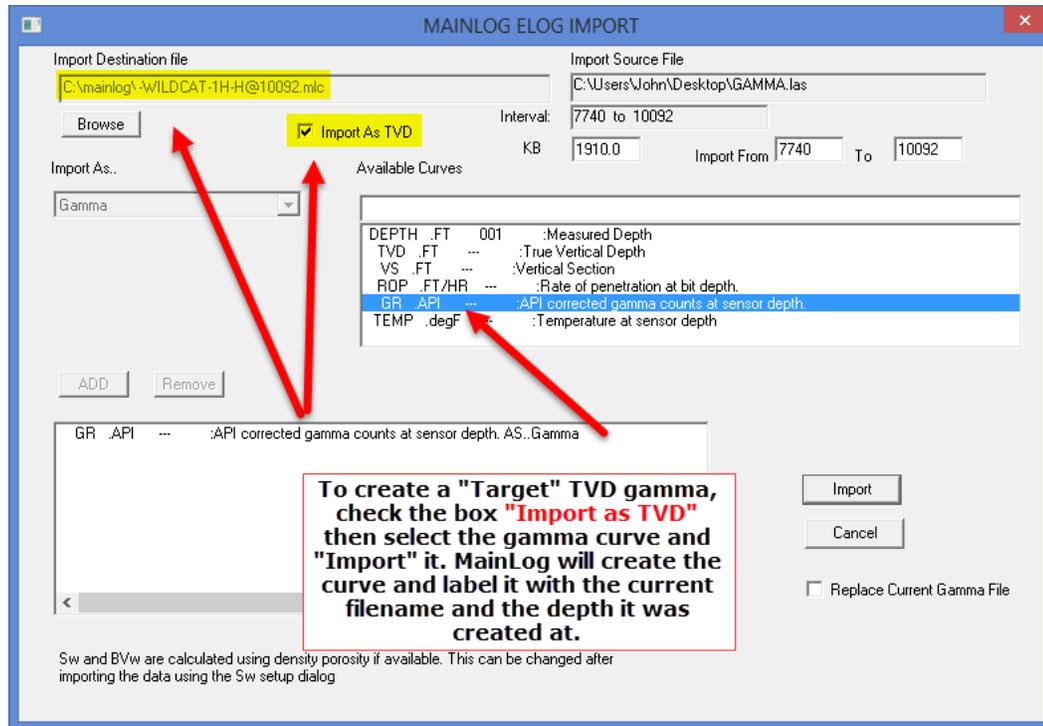
If the MWD operator can supply a LAS file with TVD and Gamma as shown below, they can be imported and displayed on the Horizontal Log at the Measured Depth (MD) the TVD gamma was taken. Multiple "Target" TVD gammas can be displayed on the horizontal log at the same time.



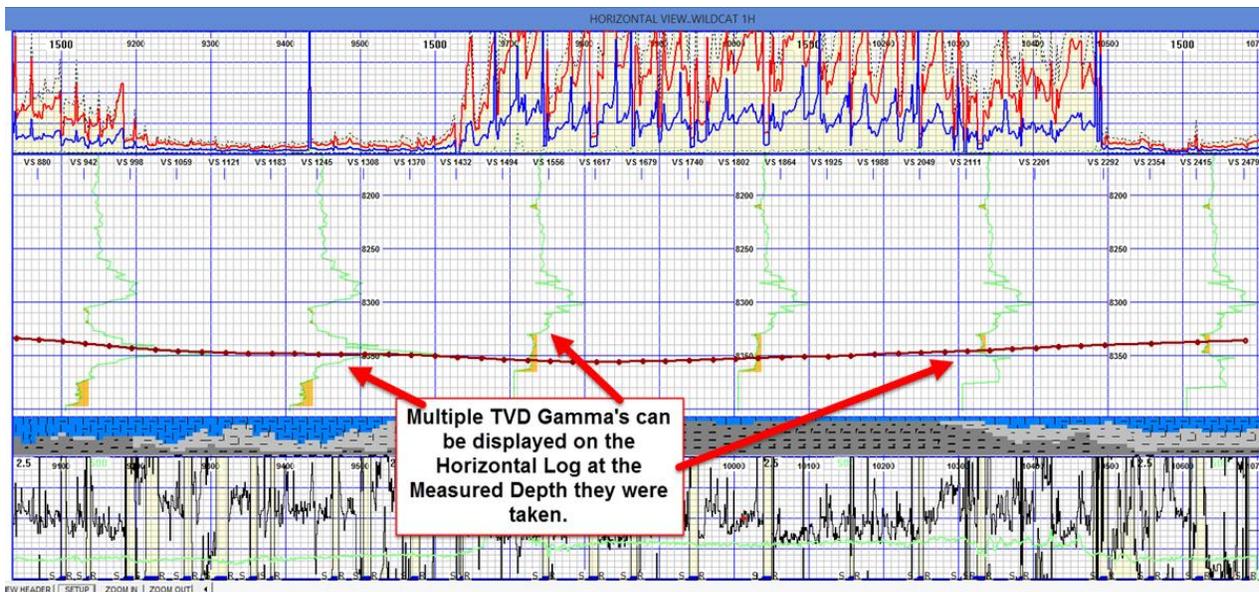
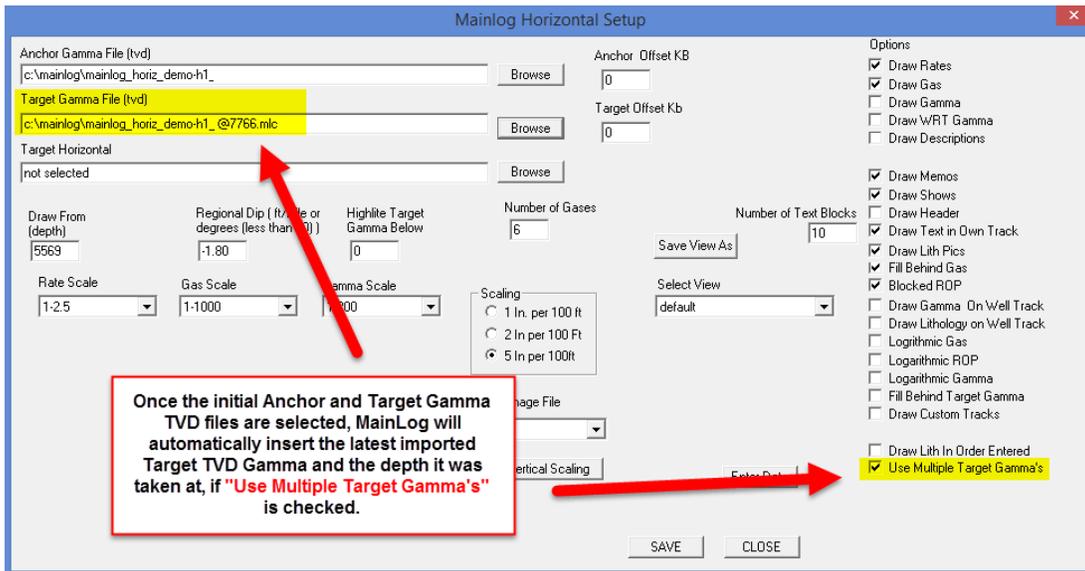
From MainLog choose **Import\E-Log Data** and select the MWD LAS file with the TVD and gamma on it.

From the dialog, to create a "Target" TVD gamma, check the box **"Import as TVD"**

then select the gamma curve and "Import" it. MainLog will automatically create the curve and label it with the current filename and the depth it was created at. (i.e., <filename>@depth.mlc). The file will NOT be selected to display on the vertical file. You can also use gamma files from offset wells, or wells that you are drilling toward when appropriate.

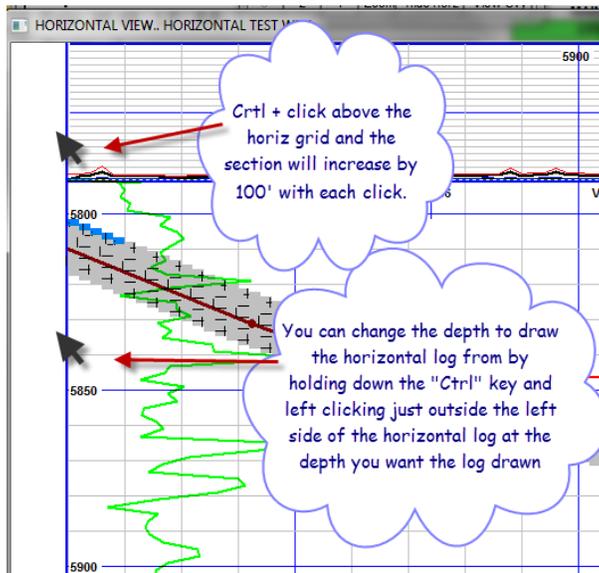


**Anchor and Target TVD Gamma's** must be selected manually in the Horizontal Setup dialog. These can be TVD gamma files that you imported, or TVD file from the pilot hole, or close offset. *IF MainLog detects multiple TVD Gamma files for the well, the **"Use Multiple Target Gamma's"** check will be enabled.* When checked each of the TVD gamma files will be drawn starting at the depth in the filename, and will be repeatedly displayed, unless and until a deeper file is found. MainLog will only look for these files in the MainLog folder, and only when "@<depth>" is part of the file name...IE <yourfilename>@10200.mlc. If there are no appropriate files found, the **"Use Multiple Target Gamma's"** will not be available. If **Use Multiple Target Gamma's** is not checked, the target gamma file will be used. **When Multiple Target Gamma's files are selected, NO REGIONAL DIP CORRECTIONS WILL BE APPLIED TO THE GAMMA'S DRAWN.**

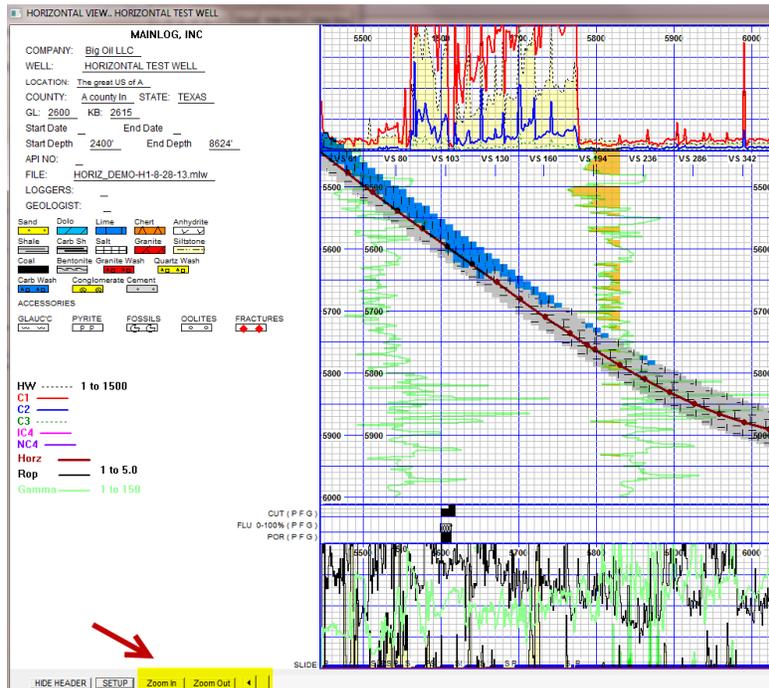


**\*Kickoff Depth: (Draw From) (Also available in Office mode)**

This can be changed to alter the total number of vertical feet drawn in the TVD or vertical portion of the display. The number can be entered directly in the edit box or can be set by left clicking on the desired vertical depth just to the left of the grid on the horizontal display with control key held down. Clicking as above to the left of lithology will move the kickoff depth up 100 Ft. Clicking near the top of the display will set it back to zero. The default is zero, and MainLog will limit the vertical interval to about 500 feet.



Another way to change the “Draw from Depth, is by using the “**Zoom In**” and “**Zoom Out**” button on the horizontal log. This is in the lower left-hand side of the horizontal display. By clicking the button, the “Draw from Depth” will be increased or decreased by 100’ whether you are zooming in or out.



**\*Regional Dip: (Also available in Office mode)**

A value in Ft/mile or degrees can be entered for regional dip and MainLog will adjust Top lines and Target Gammas to follow the dip. Negative for up, positive for down. Separate dips can be entered in each Horizontal Section. See [Edit Horizontal Section](#).

**\*Highlight Target Gamma Below**

A gamma value can be entered in to highlight the area below the Target Gamma Curve as seen above under [Target Gamma](#) .

**\*Scales: (Also available in Office mode)**

For vertical logs, under the menu **Set-up\Lines and Scales**, scales can be selected for rates, gas, and gamma. Rate and Gas Scales can be changed at specific depths, whereas the gamma scale will remain the same as whatever scale is selected. If logarithmic scale is selected for rates and gas, they will remain the same for the entire log.

Scales for the horizontal log can be selected from the Horizontal Setup Menu and will remain the same for the entire log, unless the option, “Use Vertical Gas Scale” is checked. This option is only available when using linear gas scales on the vertically displayed log. (See, [Use Vertical Gas Scales on Horizontal](#))

**\*Number of Gases (Horizontal): (Also available in Office mode)**

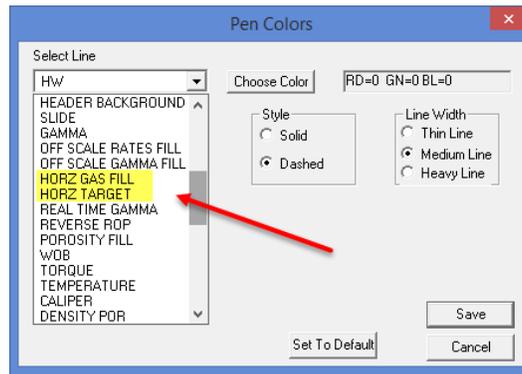
Enter the number of gases you want to plot, 1 = HW only, 2 will be HW + 1, etc.

**\*Scaling: (Also available in Office mode)**

Draw a 1 in/100 ft, 2 in/100 ft or 5 in/100 ft.  
It can also be selected from the Menu Bar.

**\*(Horizontal) Setup Colors: (Also available in Office mode)**

Most of the line colors on the horizontal are determined from what was entered in on the “vertical” display log, however, certain items can be changed so they are different from the vertical display. To change these, go to “**Setup/Log and Lithology Colors**”. They include Horizontal Gas Fill, & Horizontal Target,

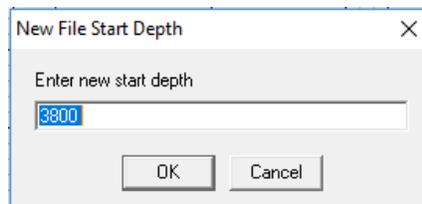


Experimenting with different colors can make a surprisingly different visual impact on the finished log. (See [Log and Lithology Colors](#) )

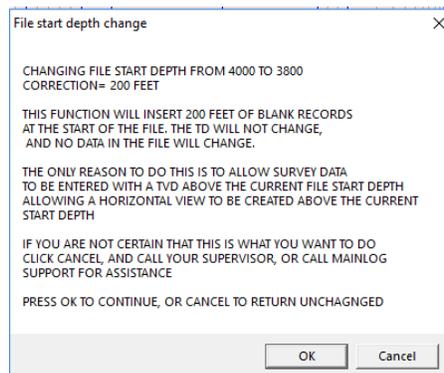
If **“Horz Descriptions”** is selected, the options to **“Draw a Rectangle Around Text”** and **“Draw Text Transparent”** become available.

### Change File Start Depth

From **Setup/Horizontal Options**, there is a button, **“Change File Start Depth”** and by clicking on it MainLog will default to a start depth of 200 feet above the current file start depth, however, the depth can be changed.



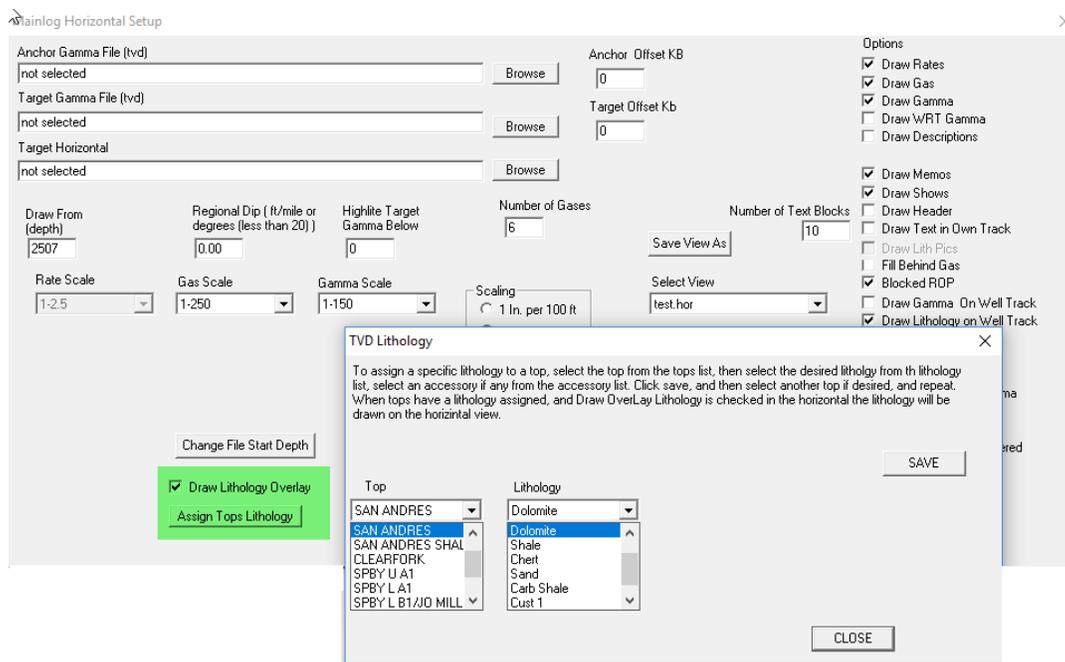
Once **“OK”** is selected, a message opens stating what MainLog will be doing to the file, also noting that added footage to the top of the log will consist of blank records. At this point you still have the option to cancel the process.

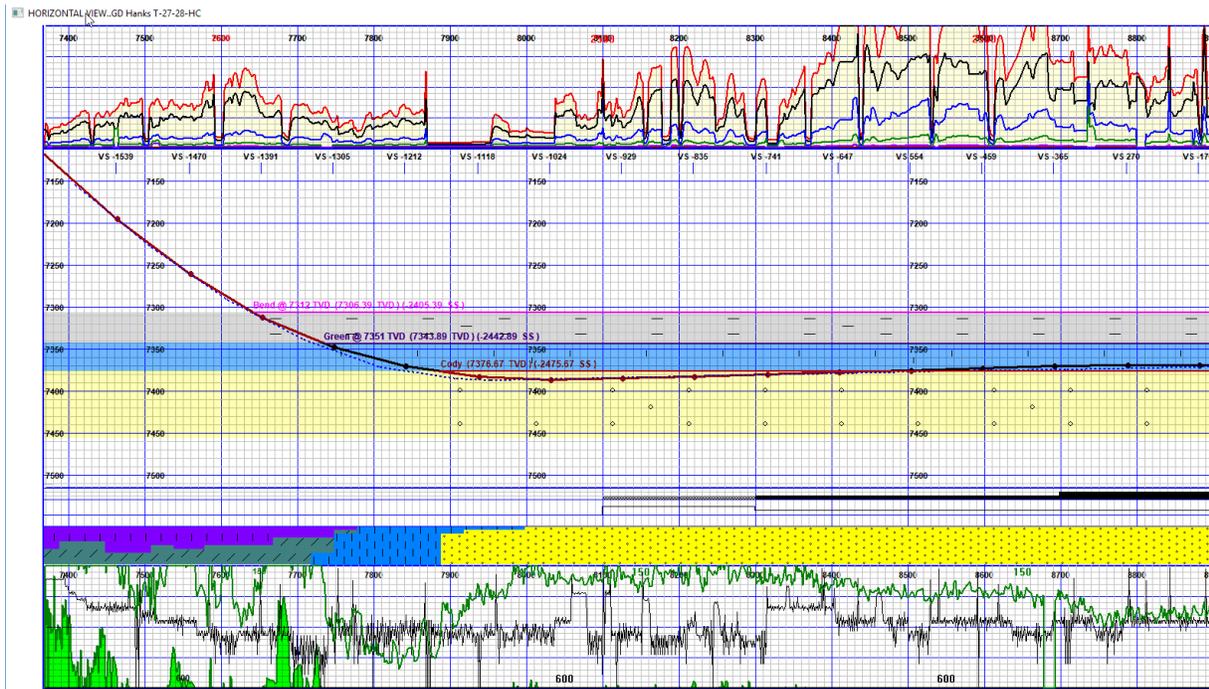


MainLog will automatically backup of the current file to the **c:\mainlog\backup** folder when you select “OK”. If by chance you added too much footage to the top of the file, you can go to “**File/Restore**” and look in the **c:\mainlog\backup** folder to select the last backup to restore the original file.

## Assign Lithology Tops

When formation tops are selected to be drawn on the horizontal, (see **Tops Menu** ) then “**Assign Lithology Tops**” can be chosen. Here lithology types can be selected for formation tops and will be displayed on the horizontal log when the **Draw Lithology Overlay** box is checked in the Horizontal Setup dialog. MainLog will fill in the lithology between formation tops as shown below.





MainLog defaults the width of the lithology drawn down from the tops line to 40 feet, but this can be edited in Edit Tops dialog. When the “**Draw on Horizontal**” box is checked, the width, in feet, of the zone can be entered.

## Faults Entered on Horizontal Display

### Edit Horizontal Section

Faults, dips and vertical sections can be to the horizontal log in sections, however, before creating any **HORIZONTAL SECTION**, set the “**Draw from Depth**” of the horizontal log first. Once any new sections are created, the **Draw from Depth** is disabled, so they would all have to be deleted to change horizontal section being

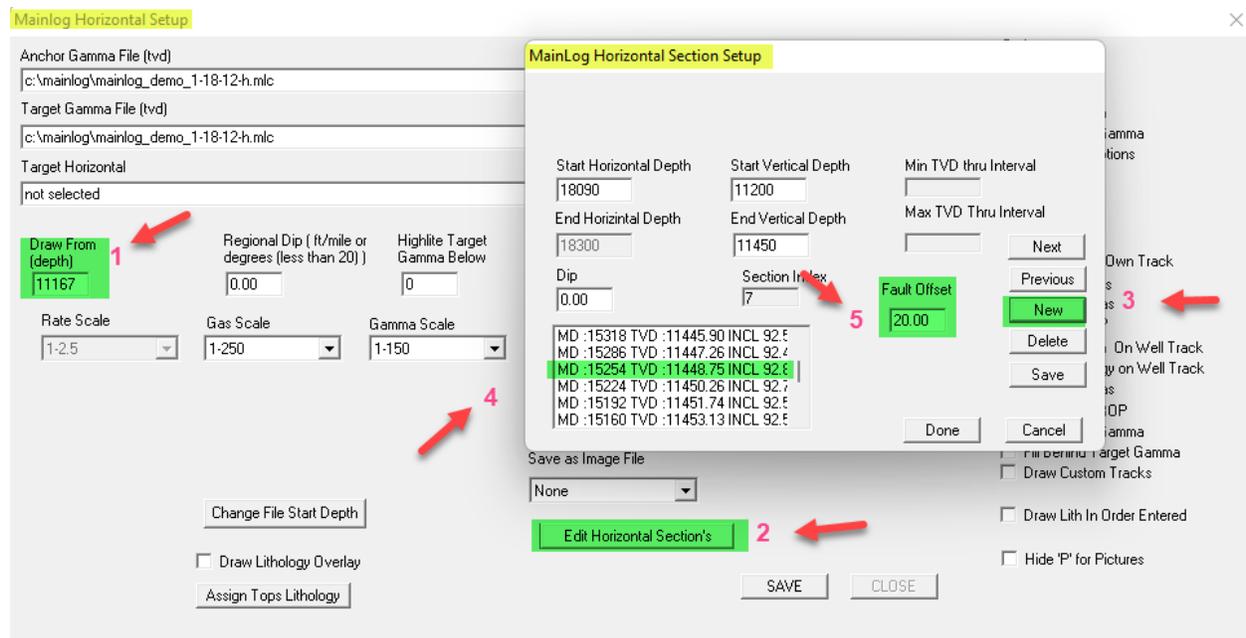
displayed. However, you can draw different vertical intervals in each section after they are created.

The horizontal log can be divided into sections and then different *dips, faults, vertical intervals*, or combinations of them can be set up for each section. From **Setup\Horizontal Options**, select **Edit Horizontal Section**. From the pop-up dialog select **New**, then choose the “**Measured Depth**” from the surveys displayed that you want the **new section to start**. The section will end at the end of the Horizontal log unless/until a new section is added. The previous section will end at the new start depth.

**At this time, new sections can NOT be INSERTED, only added after (deeper) than the last existing section**, however, sections can be edited. At this point, you can enter in the **Fault Offset** in feet and or the dip in degrees, positive or negative value. You can also change the vertical interval to be displayed within certain limits. Click **Save** and the fault will be shown on the log and dips will adjust any tops lines and target gammas on the horizontal log according to the dip. Multiple faults and dips can be entered and will be assigned a “**Section Index**” number. These can easily be edited or deleted.

**Note: When entering multiple faults, the total sum of the faults must be entered going from section to section.** i.e., In section one the fault is -20, if another fault of -10 is in section 2, then -30 should be entered in section two.

To remove a fault, open the Horizontal Setup Section, make the Fault Offset “zero” and click save. Dips can also be changed, and any “Section” can be deleted.



**\*Horizontal Save as Image File: (Also available in Office mode)**

Select the image type you want, bmp, tif, jpg etc. Whenever you open the horizontal view, an image of the type selected will be saved in the MainLog folder, or wherever MainLog is installed. Once you have the image you want, select none, as it slows down the display of the horizontal view when creating the image file.

**\*Draw Rates:**

This option turns on or off the drill rate track on the horizontal log.

**\*Draw Gas:**

This option turns on or off the “Gas” track on the horizontal log.

**\*Draw Gamma:**

This option turns on or off the “MWD Gamma” curve on the horizontal log.

**Draw WRT Gamma:**

This option turns on the “WITS Real Time Gamma” to the horizontal. For this to work, the MWD Company must “WITS” the readings to the EDR provider who must in turn WITS the data to MainLog.

**\*Draw Descriptions:**

This option turns on or off “Descriptions” on the horizontal log.

**\*Draw Memos:**

This option turns on or off, “Memos” on the horizontal log.

**\*Draw Shows:**

This option turns on or off the “Show” track on the horizontal log.

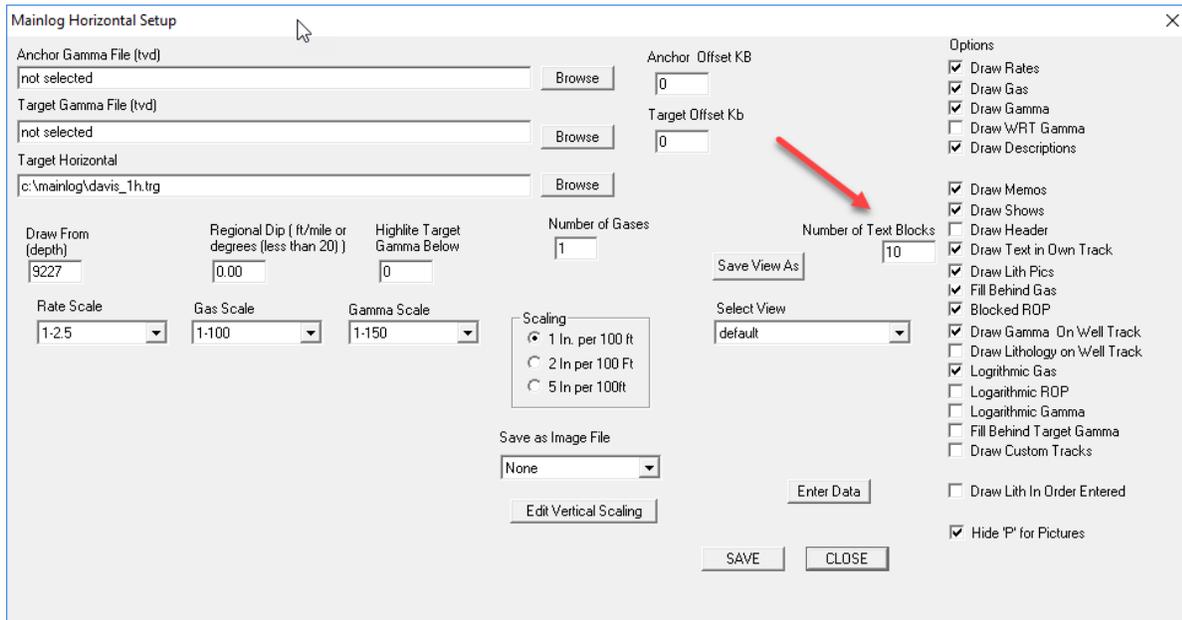
**\*Draw Header:**

This turns on or off the “Header” on the horizontal log.

### \*Draw Text in Own Track: (Number of Text Blocks)

This option will create a track on the horizontal to put descriptions in when a description was chosen to be “Draw on the Horizontal” in the memo dialog.

The width of the Text Track can be customized by entering in the “Number of Text Blocks” in the Horizontal Setup.

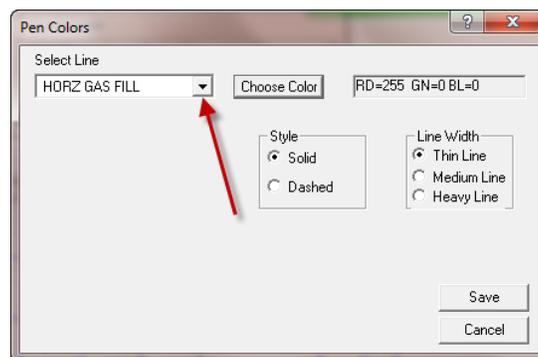


### \*Draw Lith Pics:

When checked a track with sample pictures will be added to the horizontal log.

### \*Fill Behind Gas:

This option will fill color behind the “Total Gas” curve. From the “Set-up Menu”, go to “**Log Colors**”. From here select “**HORZ GAS FILL**” and chose the color.



### \*Blocked ROP:

This option toggles between “Point to Point ROP” and “Blocked ROP”.

**\*Draw Gamma on Well Track:**

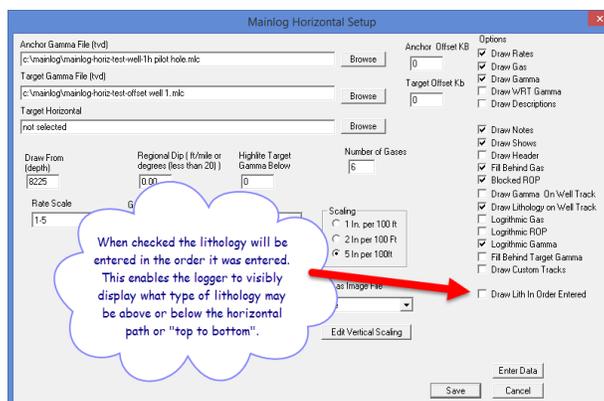
This option toggles between drawing the “MWD Gamma” on the well track or on the “ROP track”.

**\*Draw Lithology on Well Track:**

This option toggles between drawing the “Lithology” on the well track or above the “ROP track”.

**\*Draw Lith in Order Entered:**

With this option checked the lithology will be drawn in the order it was entered. This enables the logger to visibly display what type of lithology may be above or below the well path or from “top to bottom”.



**\*Logarithmic Gas:**

The option will display logarithmic gas scale on the horizontal log.

**\*Logarithmic ROP:**

The option will display logarithmic ROP scale on the horizontal log.

**\*Logarithmic Gamma:**

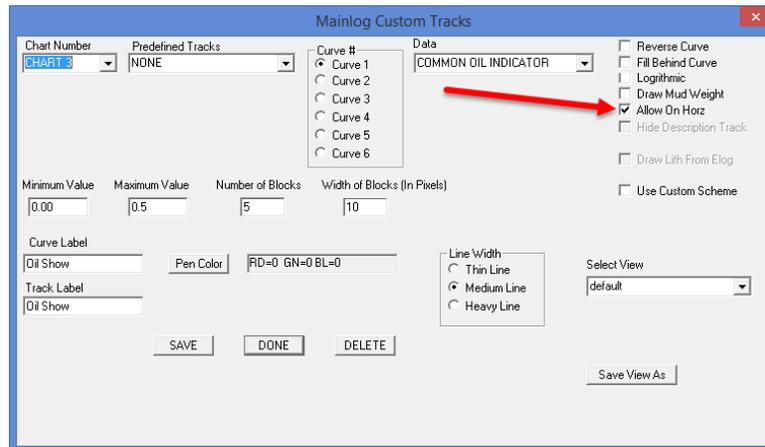
The option will display logarithmic gamma scale on the horizontal log.

**\*Fill Behind Target Gamma:**

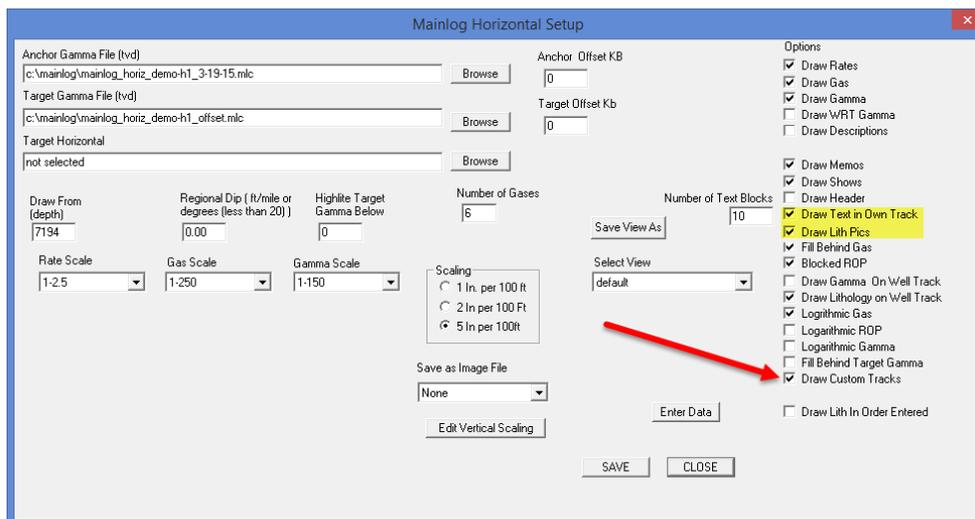
When a gamma value is entered in, “**Highlite Target Gamma Below**”, the fill behind the gamma curve on the log can be turned on or off with this option.

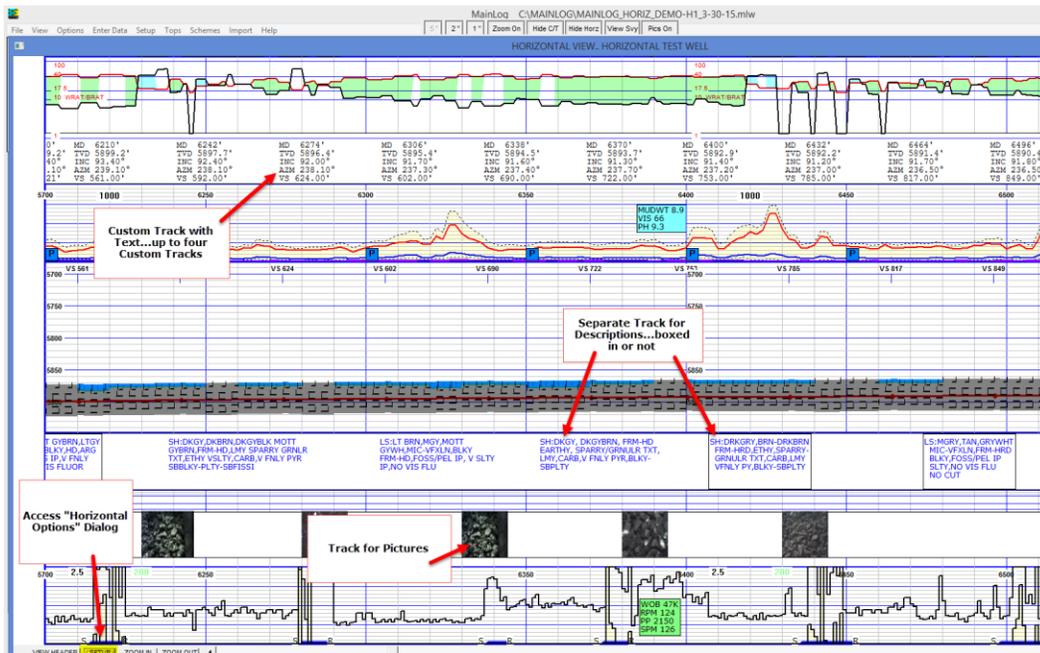
**\*Draw Custom Tracks:\_(On Horizontal)**

This option displays Custom Tracks on the horizontal. It will only apply if the track is selected from the Custom Track dialog to “Allow on Horz”.



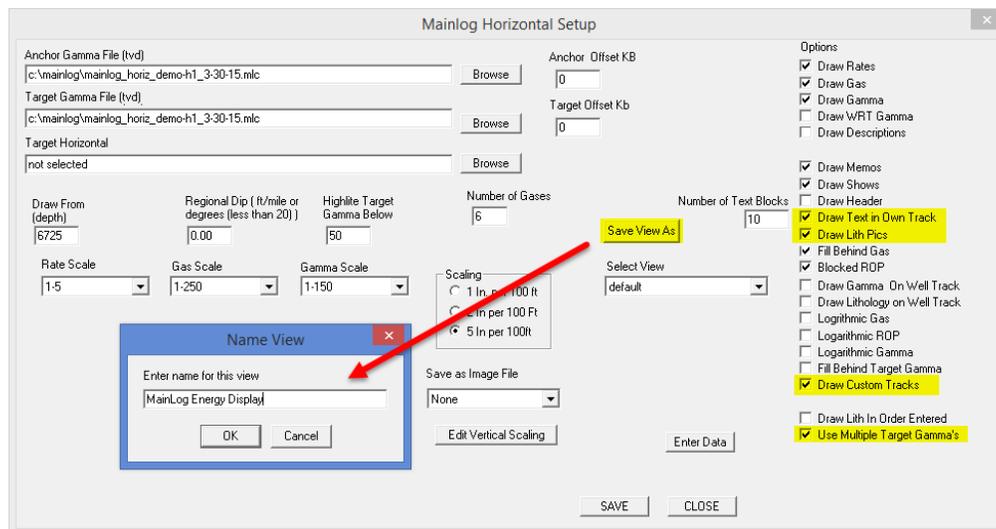
**The Horizontal is limited to four (4) Custom Tracks plus a Picture Track and a Description Track.** Notes on the horizontal cannot be entered in or moved while Custom Tracks are on.





### \* Horizontal Save View As

Horizontal format displays can be saved. (**Save View/Select View**) Once you come up with a Horizontal display that fits your requirements you can name and save it so it can be easily selected for subsequent wells and or for specific clients.

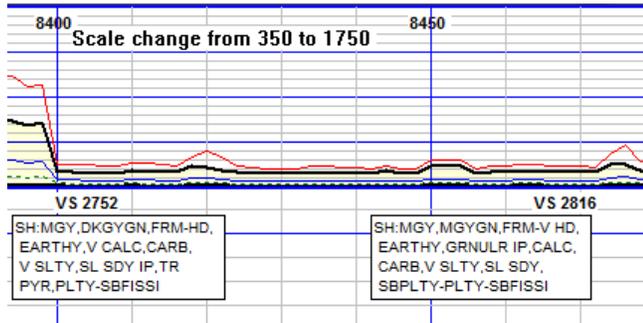


### \*Use Vertical Gas Scales: (Horizontal Scales) (Also available in Office mode)

Scales for the horizontal log can be selected from the “Horizontal Setup Menu” and will remain the same for the entire log, unless the option, “**Use Vertical Gas Scale**” is checked.

**This option is only available when using linear gas scales on the vertically**

**displayed log.** When checked, MainLog will use the same gas scales that are on the “vertically” displayed log, on the horizontal log. MainLog will automatically note any scales changes as well.



Also, when this option is checked you are unable to change scales on the horizontal from the ‘Horizontal Menu Setup’.

### Enter Horizontal Data:

Available in drilling mode only, click to enter survey information. It can also be imported from a LAS file. To edit or delete survey data, go to enter data mode, select from the list the survey you want to edit or delete. LEAVE THE “MD” UNCHANGED set TVD to 0 to delete the survey or edit values as appropriate. Click Save, then Done.

**\*\*\*Note that the horizontal log cannot be displayed or accessed until 3 or more surveys have been entered with the inclination greater than 10 degrees.**

Horizontal Well Input ✕

[This dialog should be used For HORIZONTAL inputs, general survey data, or survey corrections. For TVD well inputs, select TVD FILE DATA from the ENTER DATA MENU to create or append to a TVD (directional) file]

Enter Values	DOG LEG SEVERITY
MD    INCL    AZM    TVD    VERT SECT	SEVERITY
<input type="text" value="8604"/> <input type="text" value="93.6"/> <input type="text" value="239.3"/> <input type="text" value="5794.12"/> <input type="text" value="2971.1"/>	<input type="text" value="0.0"/>

Last Entries

MD=8634 Incl=93.6 AZM=239.3 TVD=5794.10 VSec=2971.0 DLS=0.0

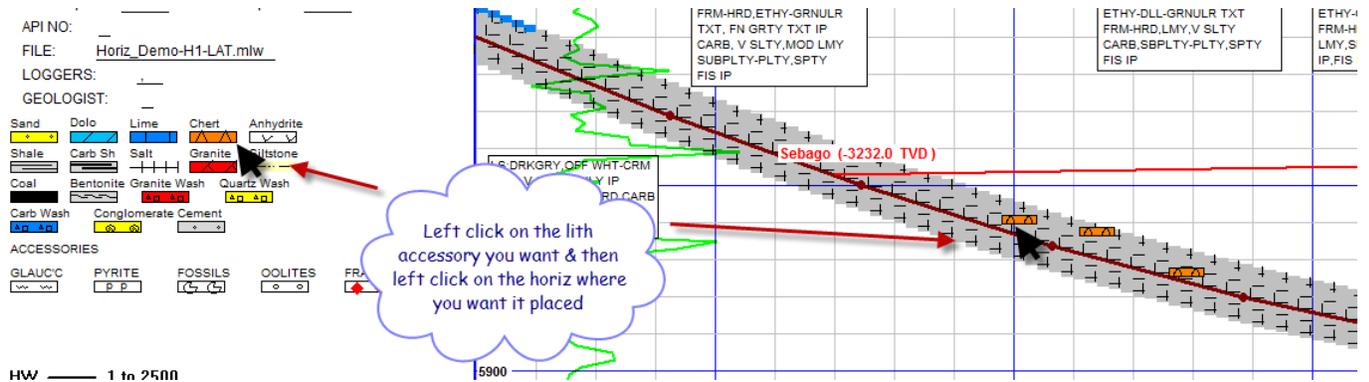
MD=8604 Incl=93.6 AZM=239.3 TVD=5794.12 VSec=2971.1 DLS=0.0

MD=8568 Incl=93.6 AZM=239.3 TVD=5797.60 VSec=2916.0 DLS=0.0

MD=8548 Incl=93.6 AZM=239.3 TVD=5797.57 VSec=2916.2 DLS=0.0

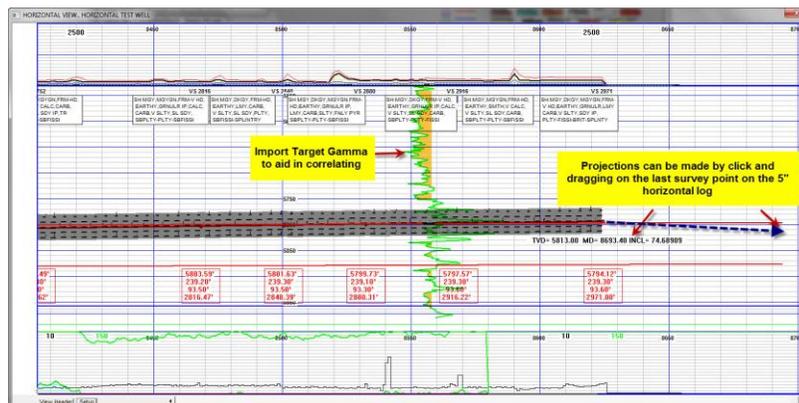
### Adding Accessories to horizontal:

Click on “View Header” to open the header. Then click the lithology symbol for the accessory you want to add. Click on the log where you want the accessory displayed. If you hold down the “ctrl” key, you can add the accessory multiple times. When done, let go of the control key, and close header or click on “Ctrl + Enter” keys to save. You can add accessories to the lithology overlay, and/or the lithology when following the well track. They will display in the right place for the view you are using. To remove, simply double click the one you want to delete.



**\* Projection: (Also available in Office mode)**

Place the mouse cursor on the last small circle on the well track line. With the mouse button down, drag it to the right. As you do, MainLog will show the MD and TVD at the mouse point, and the INCL required to achieve that TVD at that MD. When you let go of the mouse button, the last values will stay on screen. To clear them, simply scroll the log to cause a redraw.



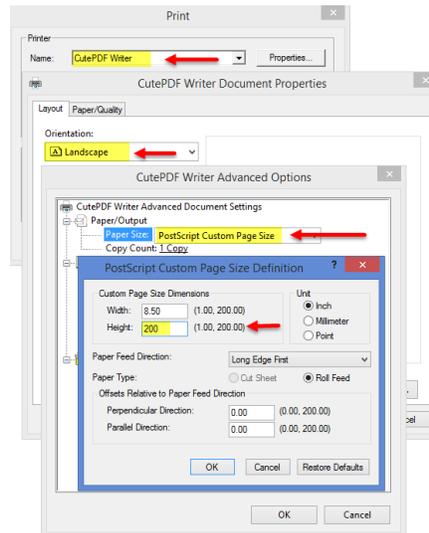
Right clicking anywhere on the grid will bring up a data box showing basic info for that depth. Right or left click again to hide.

Additional new features will be coming out over the next few months. Your input

will be greatly appreciated.

### \*Horizontal Printing:\_(Also available in Office mode)

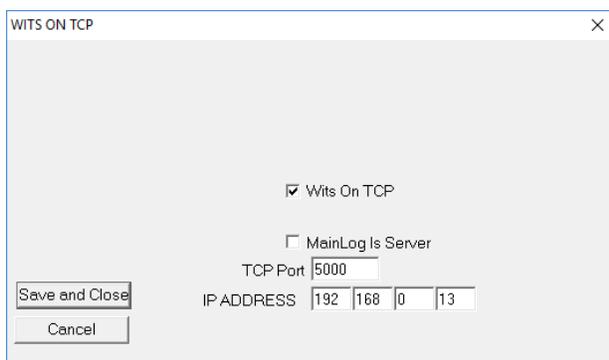
To print the horizontal, **open the horizontal view**, then go to **FILE\Print**. Enter the start and end depth, set the printer to **landscape and banner**. **\*\*Note:** in some cases, banner will not work, and you must set the “**Paper Size**” to “**PostScript Custom Page Size**” and set the height to 200 (inches).



If the header is open on the horizontal, it will print, otherwise it will not. Clicking 2 ½ inch will print the log at ½ current scale. IE if 5 in/100ft is the current scaling, it will print a 2 ½ inch log, if 1 in/100 ft. is current scaling, it will print a ½ in/100 ft. log etc.

### WITS on TCP

MainLog can receive WITS from an instrument or an EDR via a TCP connection. MainLog can also send out on TCP if needed. If MainLog is not the server, the IP address of the communicating instrument/computer (client) needs to be entered in the dialog. The TCP Port needs to be the same on both computers.

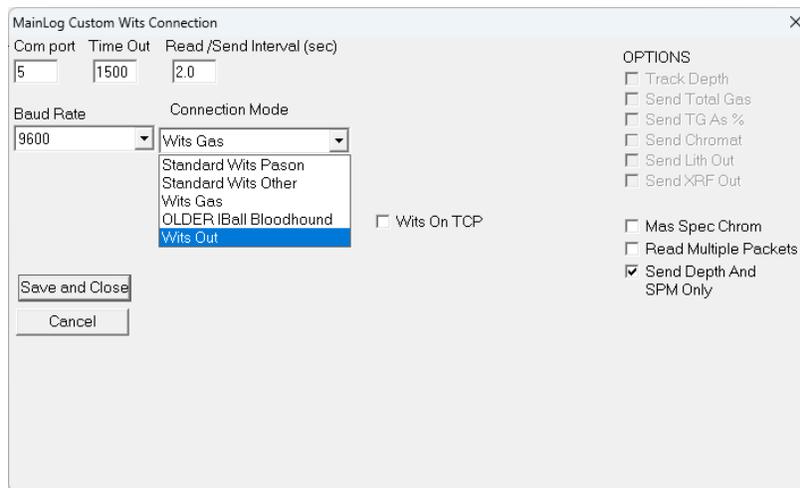


If MainLog is the Server, the TCP port will need to be the same as instrument/computer it is communicating with. The IP address of the computer MainLog is running on will need to be known to the “client”. From the **Command Prompt** on the computer type **ipconfig** to get the IP address.

## Setup Custom WITS Feed

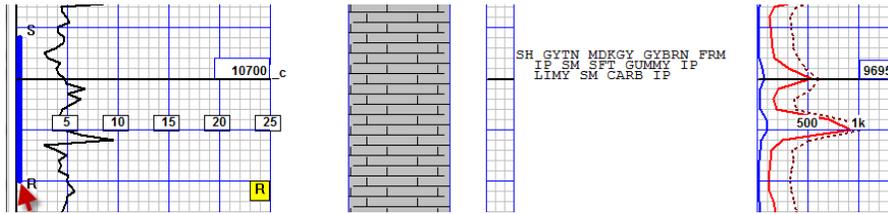
A second **Custom WITS feed** can be set up in addition to the standard WITS feed. The additional connection can be **Serial** or a **TCP** connection. Depending on the situation various Connection Modes and Options can be made. Available Connection Modes are Standard Wits Pason, Standard Wits Other (Time-based), Wits Gas, Older Bloodhound, and Wits Out.

If **Wits Out** is selected, the option to Send Lithology and/XRF data can be chosen. In this mode MainLog will forward all Wits data being sent in by the EDR and if checked lithology will also be sent after it is entered by the logger. XRF when checked will be sent once it is imported.



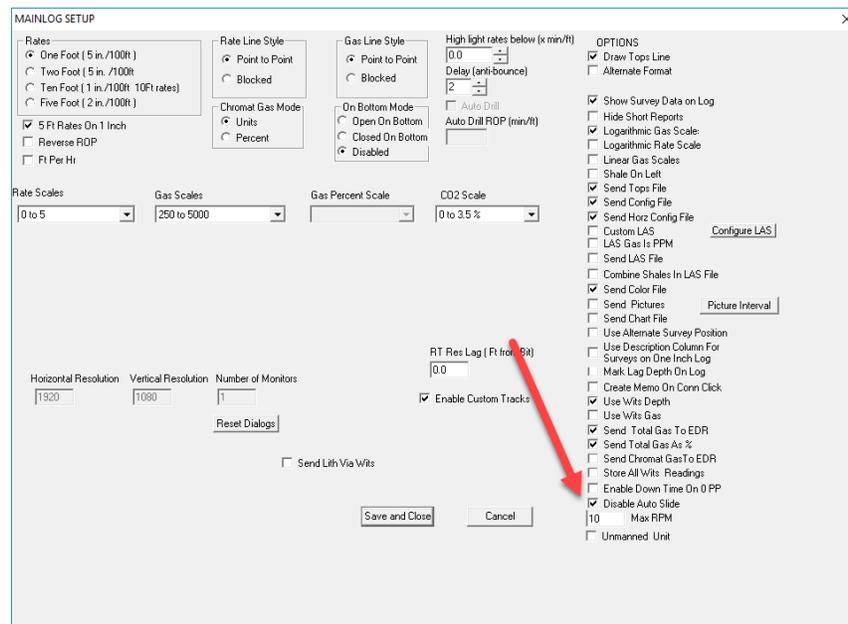
## Slide and Rotate:

When logging a horizontal well it is useful to display when the rig is either sliding or rotating. MainLog automatically draws the “Slide-Rotate” line on the mudlog, ***but only if there is an incoming WITS feed.*** Through the WITS feed, MainLog can determine if they are drilling and if the RPM’s are zero. MainLog will then draw the “slide” line until it sees the RPM’s go above zero.



When sliding, some rigs may still rotate at very low RPM's, (i.e. less than 10) so a **Max RPM** value can be set by going to **Setup\ Lines and Scales** and under **“Options”**, enter in a maximum RPM value that MainLog will still consider a slide.

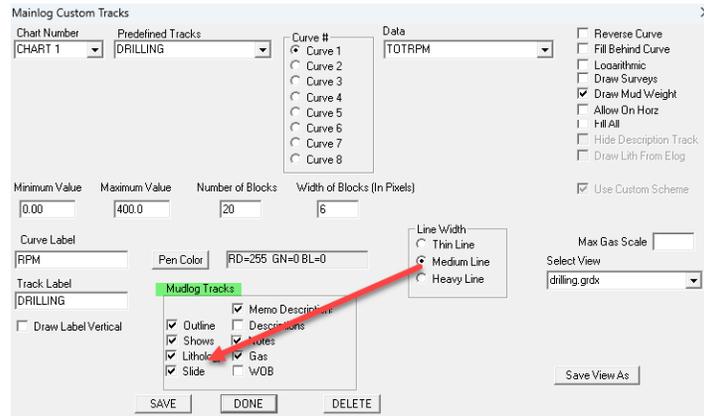
The feature defaults to **“On”** but can be turned off by going to **“Set-up\Lines and Scales”** and checking **“Disable Auto Slide”** under **“Options”**.



If MainLog does not see an incoming WITS feed, the logger must manually enter the slide. **To do this hold down the “Control key” and then “click and drag” down in the first block of the ROP column,** MainLog will draw and label a **“Slide to Rotate”** line in that space. By doing this MainLog will also automatically add it to the horizontal log as well.

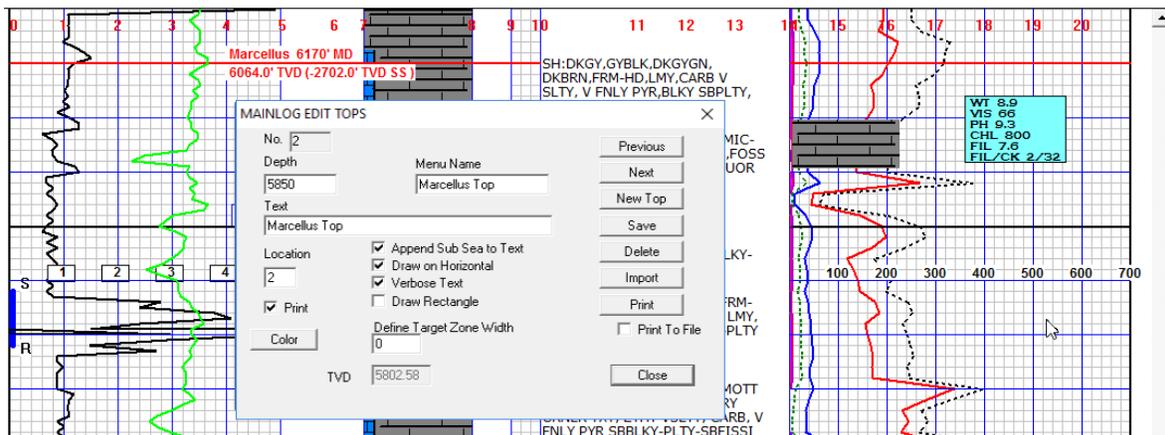
**\*\*\* Slide Trouble Shoot:** If you are not seeing the Slide\Rotate show up on the log, check to see if **Disable Auto Slide** is checked in **Setup Lines and Scales**. **(uncheck it)** Two other places to check is under **Schemes\Edit**. Make sure **Slide** is checked on both the Mudlog and Custom Schemes. It is possible that it may be

grayed out so, next turn on Custom Tracks and open the custom track dialog by right clicking on any track. Make sure that **Slide** is checked under **Mudlog Tracks**.

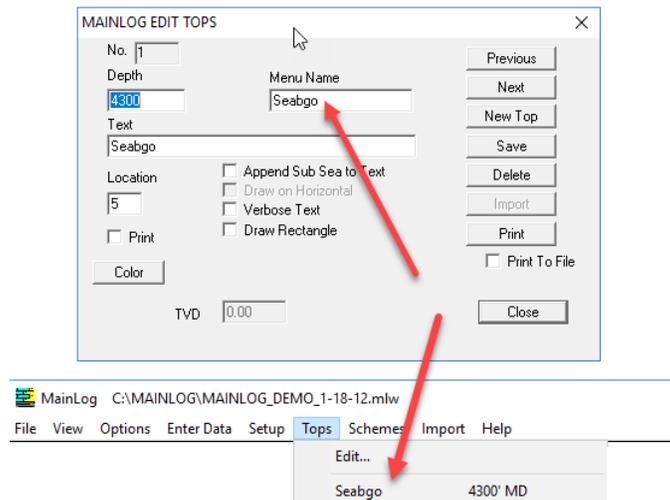


**\*Tops Menu (Also available in Office mode)**

## Tops

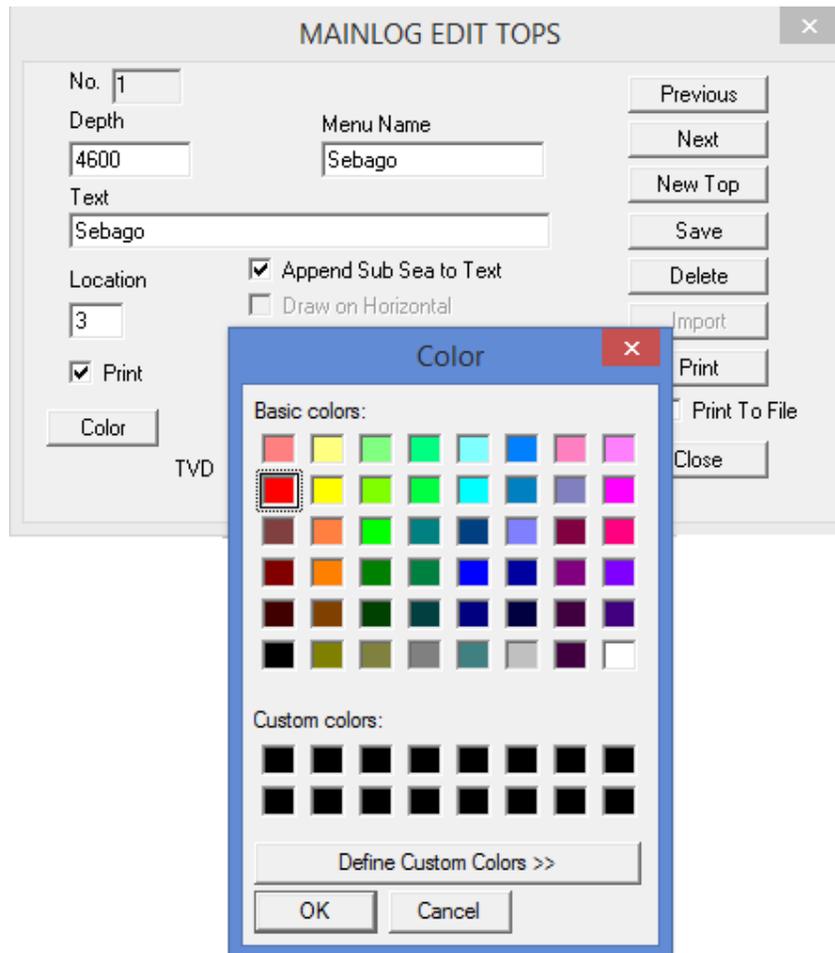


Click on **Tops>Edit** to edit or add a new top. Enter the depth for the top. **Enter a name for the top in the “Menu Name” box (i.e. Sebago)**. If you leave the Menu Name blank it will not be put in the Tops Menu, but the tops line will still be on the log.



***When you hit enter or tab after entering the menu name, the menu text will be copied to the text box.*** Enter any text you want displayed with the top line (max 40 char including subsea depth). If you check the Append subsea check and there is a KB entered in the header, the subsea depth will be appended to the text. Enter a location for the text if desired, and the default location is the left border of the rate grid. A red line will be drawn at the depth selected across the whole log excepting the description section. **You can drag this line up and down to make corrections; the subsea depth (if any) will automatically be updated.**

The Tops line can be tuned off in the **Setup/Lines & Scales** dialog. This turns off printing of the tops as well, otherwise the tops lines and text will be printed on all log formats, in top color selected (red by default), if color is selected in the print setup. The Tops line can also be turned on or off in the Print menu. You can change the color of the line directly in the Tops Edit Menu.

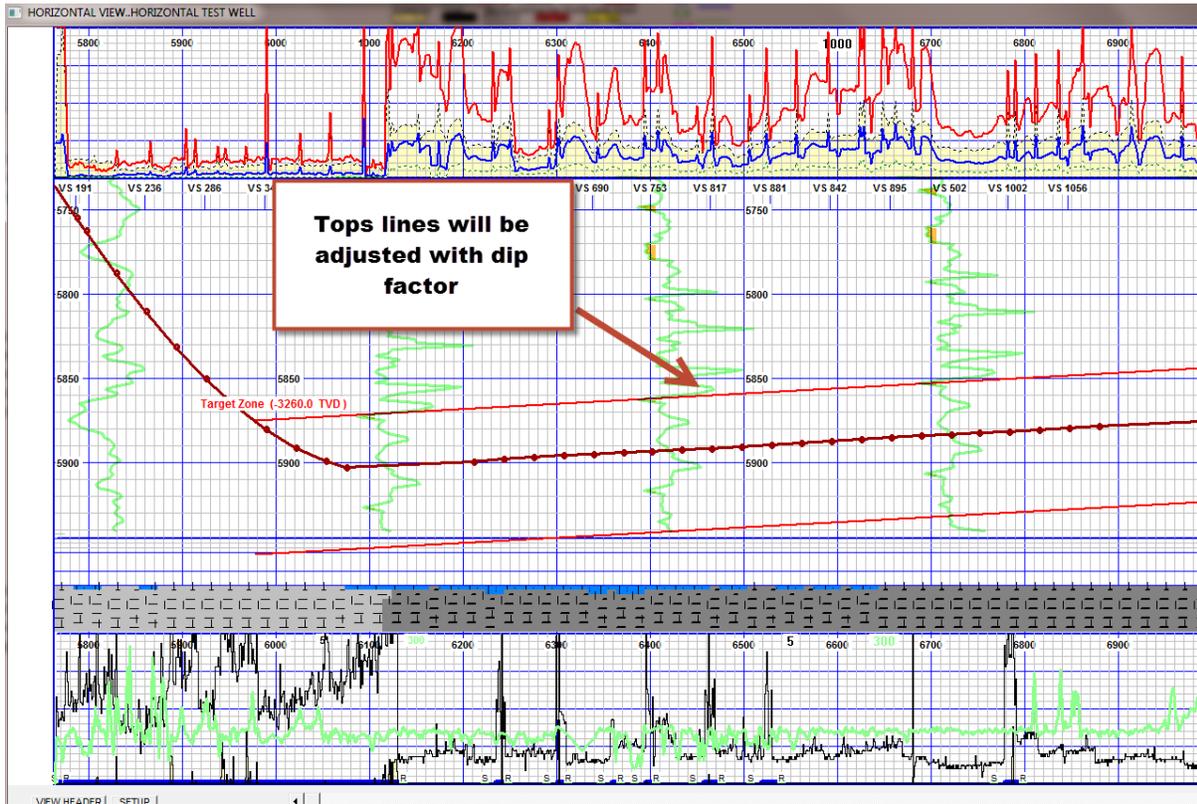


If you add the top to the **Menu Name**, selecting that top from the menu will scroll the log to start ten ft above the top depth (if the top is not already on screen). You can create as many tops as you like, with or without text. A maximum of 40 can be added to the “Tops” menu for fast access to those points in the file.

**If you have two or more wells close by, you can import an existing tops file by clicking the import button.** This will bring up a file open dialog. Select the tops file you want to import and the tops from that file will be saved to <filename>.tops, where filename is the first part of the file name now open. Once imported, you can simply drag the tops line up or down to the correct depth for this well file. **If there is a top file (.top) already associated with this file, it will be overwritten.**

From the dialog, by checking “**Draw on Horizontal**”, MainLog will calculate the TVD for the MD entered for the top. This is where the top will be drawn on the horizontal. *You can also define the width of the “Target Zone and MainLog will draw a line on the bottom of the zone.* Lithology can be filled in the defined zone by selecting **Assign Lithology Tops** in the Horizontal Options dialog. See [Assign Lithology Tops](#)

In the Horizontal Options menu if a dip factor is entered the tops lines on the horizontal will be adjusted with the dip.



## \*Schemes Menu (Also available in Office mode)

This option can be found under *Schemes* on the toolbar. *Edit Schemes*.

### Edit Schemes

A log can be customized to meet the client's needs, and whatever is displayed on the screen, will be printed that way. There are two Schemes, a **Mudlog Scheme** and a **Custom Scheme** which is tied to **Custom Tracks** to create a custom format or display.

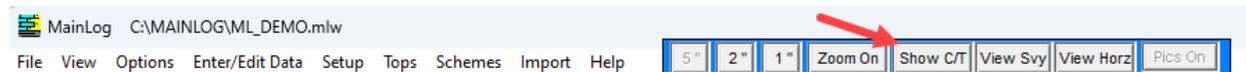
The Mudlog Scheme allows you to turn on or off any data type in a track, but it does not hide the track only the data in it. It also has certain items that can be turned on/off in a track such as Flare, WOB, Mud Wt., etc. \*Note, when selecting the Mudlog from the "Schemes" tab, it will turn off custom tracks. Below is a

screen shot of the items that can be turned on or off.

If **WOB** is selected in Schemes, it will be displayed in the ROP column. The color can be changed in **Log and Lithology Colors** and the **WOB Scale** can be changed in the **Lines and Scales** dialog under **Max WOB Scale**.



MainLog defaults to **Scheme 1** or the **Mudlog Scheme**; **this is where logger data entry and editing predominately takes place**. Exceptions would be with Memo Notes or Short Reports; if they need to be displayed on a **custom track**, then they should be entered in on the Custom Scheme. By using the Quick View Bar above the log header, you can toggle between a Custom Log and the Standard Log.



**To edit ITEMS on the Custom Scheme**, with Custom Tracks on, **Click Schemes\Edit...Custom** and select them in the scheme dialog. If Custom Tracks are off click, **Schemes\Edit...Next** to open the Custom Scheme dialog.



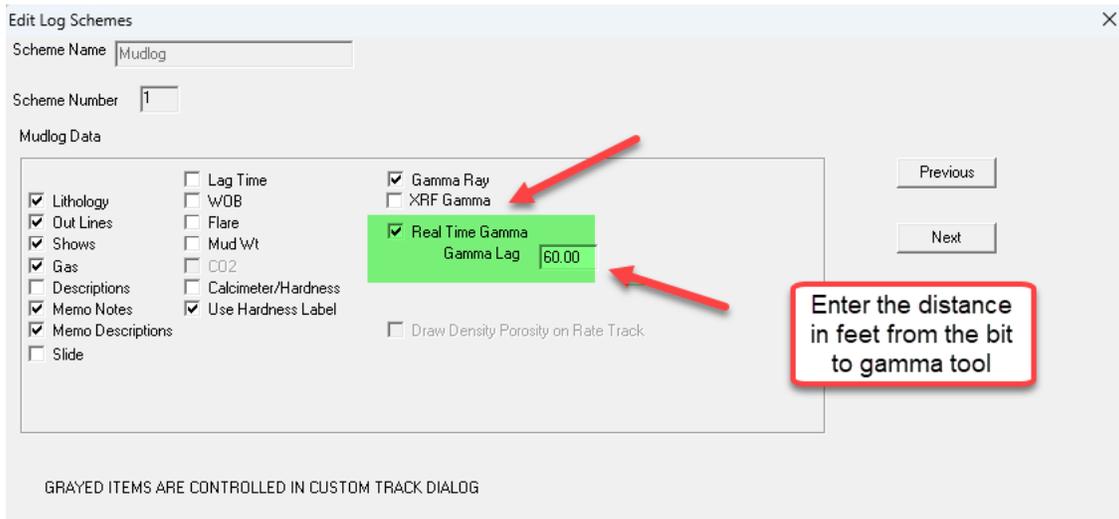
For those who want to hide any track and format a custom log, this is accomplished by first opening **Custom Tracks**, then right clicking on any track to open the **Custom Tracks Dialog**.

(See [Custom Tracks](#) and [Steps to Create a Custom Track or Log Format](#))

### Real Time Gamma

MWD Gamma can be plotted real-time via a WITS feed if the EDR provider is sending it. The standard WITS code for Real Time gamma is **0824**, however, when this is being sent by the EDR provider they send it out in a separate packet from the standard drilling information we receive. This will affect the WITS percent coming to MainLog, potentially causing data to be missed. We highly recommend using the **spare WITS code 0146 for Real Time Gamma, which you can request the EDR provider to change.** Being a “01” code rather than a “08” code it will be sent in the same packet as the other “01” codes we receive (ROP, PP, RPM, SPM, etc.) thus alleviating any potential missed data issues.

If this is available, go to **Schemes/Edit** and check the box “**Real Time Gamma**” and enter the “**Gamma Lag**” (distance in feet), from the bit to the gamma tool and click **Save**. Do this on both the Mudlog Scheme and Custom Scheme.

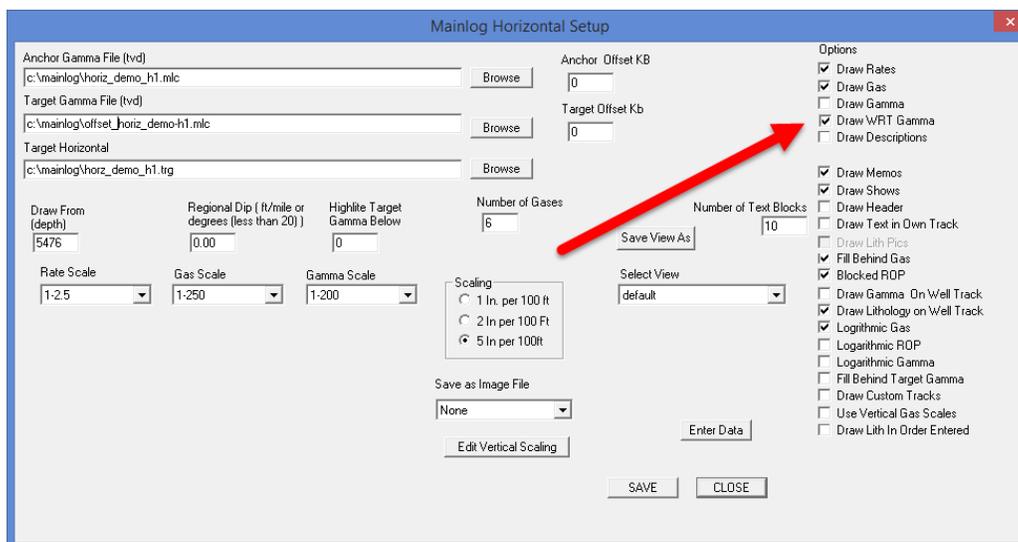


When this is done an RTG, (Real Time Gamma) box will be seen on the WITS Menu box.

MAINLOG WITS MONITOR RUNNING ON COM 8								
DEPTH	BIT DEPTH	WOB	RPM	TORQUE	PP	SPM	SPM2	SPM 3
8837.98	8837.98	30	60	1938	2000	80	98	80
FLOW	PIT VOL	GAIN / LOSS	RTG	AT	PERCENT	BYTES IN	BYTES OUT	
20	40		155	8837.98	100.0	6000	310	

It is recommended to get a LAS file of the gamma periodically and import it as MWD companies will make corrections to the curves after the fact.

Real Time Gamma can also be shown on the horizontal log by going to **“Horizontal Options”** and checking the option **“Draw WRT Gamma”**.



## Import Menu

By clicking on **Import** the following selections are available:

*Import Gamma and Elog Data  
Select*

*Import Horizontal Target Data*

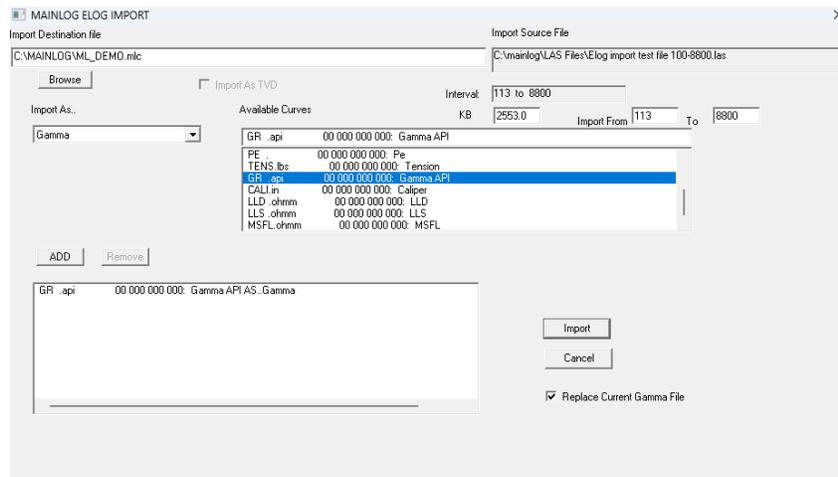
*Import Mudlog Data*

*Import ROP from text File*

### \*Import Gamma and Elog Data (Also available in Office mode)

The import function allows you to import Gamma and E-log Data from any certified LAS (log ASCII standard) file generally provided by most, if not all wireline companies. If the LAS file is in “**wrap**” mode, this function **will not** work (an “unwrapped” file should be available from the wire line company). You will first be prompted for the file name of the source file. This file must have an “LAS” extension.

Once the file name is selected, assuming it is a certified LAS file, a dialog box will be displayed showing the file names and depths, and on the right side of the dialog a list box which contains the names of the various “curves” found in the LAS file.



Select from the “curves” list box the curve you want to import and then match it to the curve “type” from the list box on the left., Click on the **ADD** button and that curve and type will be displayed in the selected list box. Repeat this for each appropriate curve, and when all curves are selected, click **Import**. Before importing, be sure the KB displayed is correct, if not; correct it in the edit box.

From the dialog box, you will see the “**Import Source File**” and its location on the upper right and the “**Import Destination File**” to the upper left. The Destination File Name will default to whatever the Mudlog File Name is and will display the curve in the ROP column on the log. You can, however, rename the destination file curve. For example, if you are importing a gamma curve from an offset well you may want to give it the name of the offset.

*If you do rename the destination file MainLog will bring up a dialog that states that the **imported** curve file name is different than the **current** curve file name and that MainLog will continue to use the current file on the vertical log.*

To select the new file, go to **Import-Select** and choose the gamma file that you want to use on the vertical log.

Where this really comes into play is when you want to import a gamma curve to use for an “Anchor” or “Target” gamma on the horizontal well and not replace the current curve on the vertical log. In other words, if the “Destination” filename is changed, when importing, it will not replace the current “mlc” gamma curve file being used in the ROP column on the vertical log.

Go to **Setup/Horizontal Options** to choose the “mlc” gamma curve file needed as the Anchor and/or Target curves. To change the “mlc” curve file on the vertical log go to **Import/Select** to select the gamma curve used in the ROP column.

The imported files will have an “**.mlc**” file extension which can be selected to be transposed onto the mudlog by going to **Import/Select** and choose the file. It is in binary format and cannot be edited.

You can import additional curves into the same file provided the total depth of the file is equal to or greater than the LAS file you are importing. Once imported, any or all the curves can be displayed in the Custom Tracks Column. **Also, note that regardless of what the logging depth is on the mudlog, the entire e-log file will be imported below what the file depths are for the mudlog.**

It is not unusual to have more than one source file for the same well. If this is the case, import the deepest file first, and then any other files can be added.

(“Curves” will always refer to e-log data in this manual). MainLog will allow you to import the following “curves”: Gamma, Density Porosity, Neutron Porosity, Cross-plot Porosity, Sonic, SP, PE, up to six Resistivity Curves and Caliper. If no cross-plot is available, AND you are importing both a neutron and a density curve, the cross plot will be calculated as an average of the neutron and density.

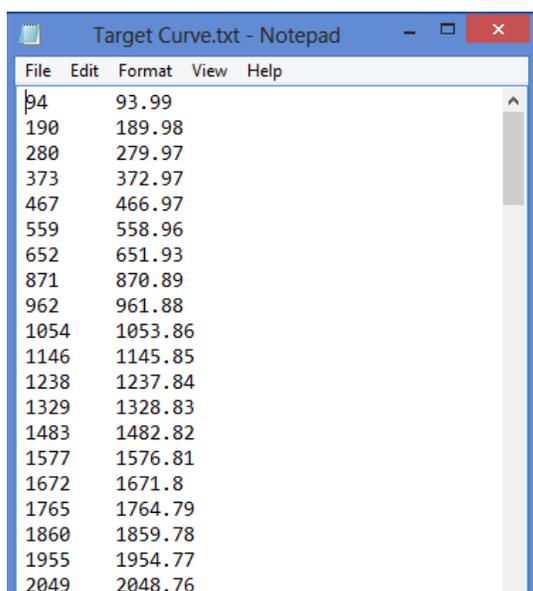
**\*Select (Also available in Office mode)**

From **Import/Select** you can choose either an **Elog** MLC file you imported or a MainLog mudlog **ROP** curve. If you choose **Elog**, select the mlc file from the dialog box that you want transposed onto the mudlog. Go to **Schemes/Edit** to set up your formats. See “Schemes” page.

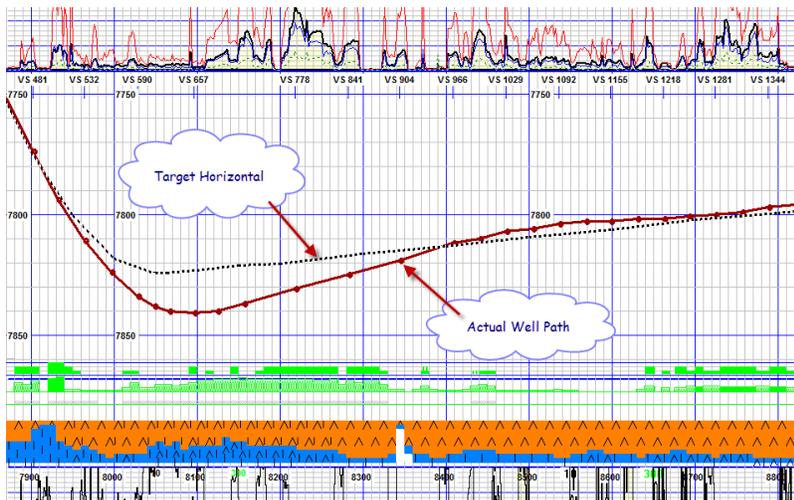
When clicking on **Select /ROP**, choose from the dialogue box the mudlog, “MLW” file, you want transposed onto the log. When you select the mudlog the box will automatically close. Go to the “**Options**” menu and click “**Offset ROP**”. The offset ROP will be displayed red, and you can click and drag on the curve, up or down, to correlate. Below the ROP column is the display of how high or low you are to the offset well. To remove the offset ROP curve, go back to “**Options**” and de-select “**Offset ROP**”.

**\*Import Horizontal Target Data**

Under **Setup**, “**Import Horizontal Target Data...**” can be selected to import a text file to display the proposed well path on the horizontal log. Below is the text format required for the import function to work. The first column is the Measured Depth (MD) with the associated True Vertical Depth (TVD) on the second column of the proposed well path. Once imported, MainLog creates a <filename>.trg file, which can be selected from the Horizontal Options Menu and then display the proposed well path along with the actual well path for comparison.



MD	TVD
94	93.99
190	189.98
280	279.97
373	372.97
467	466.97
559	558.96
652	651.93
871	870.89
962	961.88
1054	1053.86
1146	1145.85
1238	1237.84
1329	1328.83
1483	1482.82
1577	1576.81
1672	1671.8
1765	1764.79
1860	1859.78
1955	1954.77
2049	2048.76



The color and style of the line can be changed in **Setup...Log and Lithology Colors** under HORZ TARGET.

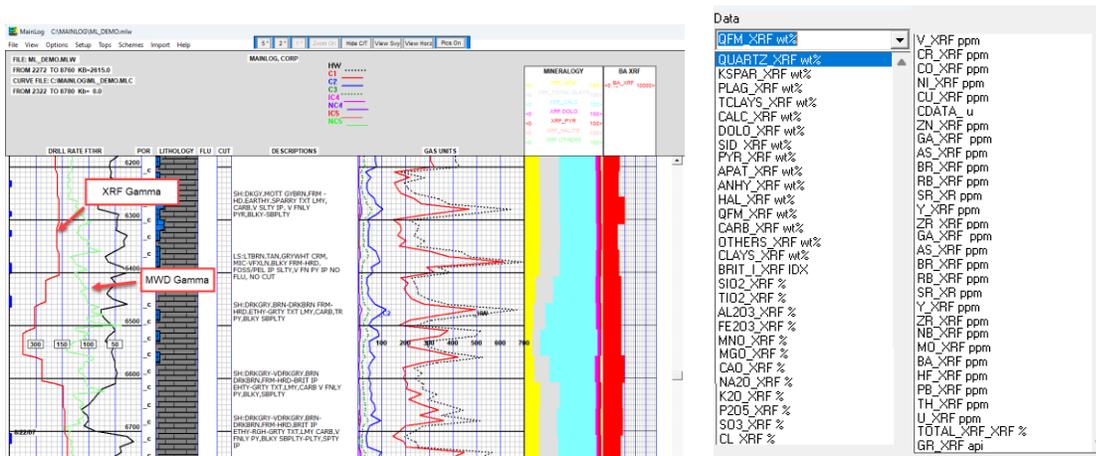
## Import Mudlog Data

Various mudlog and drilling data can be imported from LAS files, when available. There is a 200-foot limit on ROP and Gases, but other data can be imported with no limit on the interval. This includes survey data, **Gamma and E-log Data**, **Mass Spec**, XRF data and XRF Gamma, etc. See **Import Gamma and Elog Data** for additional information on how to import.

## Importing XRF

XRF items can be added to a Custom Track individually or as a group of elements if they are imported as a weighted percent adding up to 100% as shown below. When selecting elements in MainLog that can be grouped as a weighted percent of the total, they will have “wt%” next to their symbol. Up to eight different elements can be displayed in one track and must total 100% in the LAS file from which it is imported from.

Barium (ppm) is shown below in its own track and **XRF Gamma** can be displayed in the ROP column when selected in the **Schemes** dialog. Just like e-log curves you can import these from the office version of MainLog. (no drilling key required)



When creating a **XRF LAS File** for importing it to MainLog, just enter the “**Depth**” that the sample was caught at with the data following. For the first sample MainLog will automatically enter data 30’ above that starting depth. For example, if the first sample that was caught at 12000’, MainLog will enter data on the log from 11970’ to 12000’. On all subsequent samples, MainLog will draw from the previous depth, down to the depth of the next sample. i.e from 12000 down to 12100 in the example below, and then 12100 to 12150’.

```

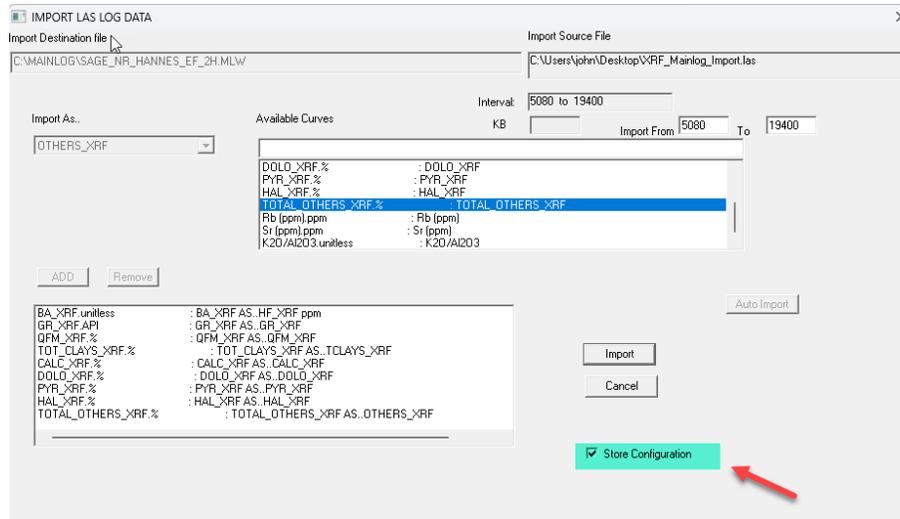
~CURVE INFORMATION
#MNEM.UNIT      API CODE      CURVE DESCRIPTION
#-----
Depth.ft                : Depth
BA_XRF.unitless        : BA_XRF
GR_XRF.API              : GR_XRF
QFM_XRF.%              : QFM_XRF
TOT_CLAYS_XRF.%        : TOT_CLAYS_XRF
CALC_XRF.%             : CALC_XRF
DOLO_XRF.%             : DOLO_XRF
PYR_XRF.%              : PYR_XRF
HAL_XRF.%              : HAL_XRF
TOTAL_OTHERS_XRF.%    : TOTAL_OTHERS_XRF
~Params
~OTHER INFORMATION SECTION
~A Depth  BA      GR      QFM  TCLAYS  CALC  DOLO  PYR  HAL  TOTHERS
12000.00  6056.09  100.73  17.69  55.97  20.32  0.00  4.05  0.00  1.97
12100.00  8854.77  109.72  17.67  55.86  21.54  0.00  2.66  0.00  2.28
12150.00  5270.46  104.13  20.63  55.73  18.97  0.00  2.93  0.00  1.74
12200.00  5482.46  101.69  20.31  56.23  18.86  0.00  2.83  0.00  1.77
12250.00  6561.13  110.19  16.50  58.31  19.78  0.00  3.38  0.00  2.03
12300.00  5247.30  114.62  16.16  58.62  20.00  0.00  3.49  0.00  1.73
12350.00  6479.19  118.33  17.64  62.80  14.21  0.00  3.32  0.00  2.04

```

From the dialog choose the depths that you want to import from. This works like importing gamma, just select the item under **Available Curves** and then select the item under **Import As** and then **Add** it to the list. Do this for each item. Then click **Import**.

You can store the imported data by checking **Store Configuration** and the configuration will be saved. It CAN BE used each time from any **LAS file WITH THE SAME NAME**. (This is not necessary or available when only importing the

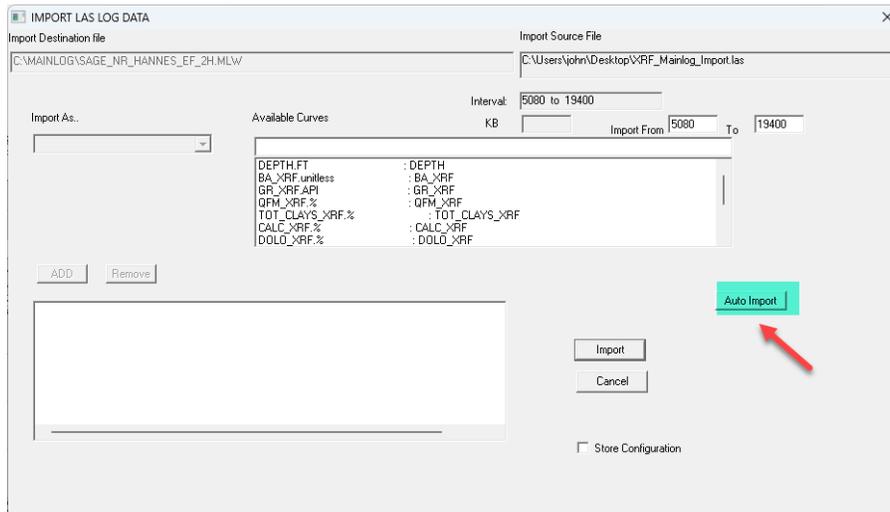
gamma).



It's available only when importing surveys, Mass Spec data, XRF data, or other MUDLOG data. Simply check **Store Configuration** before importing the first time, and when you do get a new las file, **save it to the SAME NAME on your computer**. Perhaps import svy.las or import xrf.las. Including your well name in the name might be useful as well. \*\*If you add any additional items to the existing LAS file that need to be imported you will have to re-select each item again when importing and then choose “Store Configuration”.

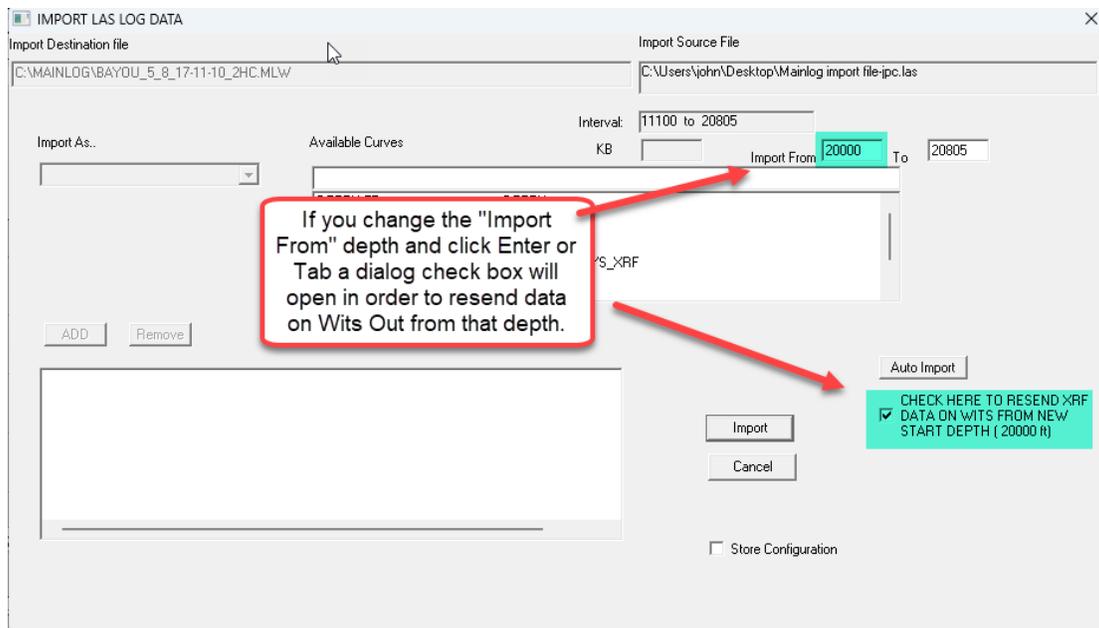
**\*\*Be certain that the data in the las file is in IN THE SAME ORDER each time!**

When you click on “Import Mudlog Data” and choose the LAS to import, the **Import LAS Log Data** dialog will open. It will display the Import Source File and the “Interval” of the file. If you previously imported the file and “Stored” the Configuration, you can check “**Auto Import**”. MainLog will add the new data to the log.



If XRF data is selected to send out on WITS, then each time the data is imported, MainLog only imports and sends the new data in the file even though it may contain previous up hole data. The reason being, sending out the entire XRF data on “WITS Out” may bog down the system, so only new data is sent. If the XRF data is not being sent out on Wits, then the entire LAS file will be imported each time.

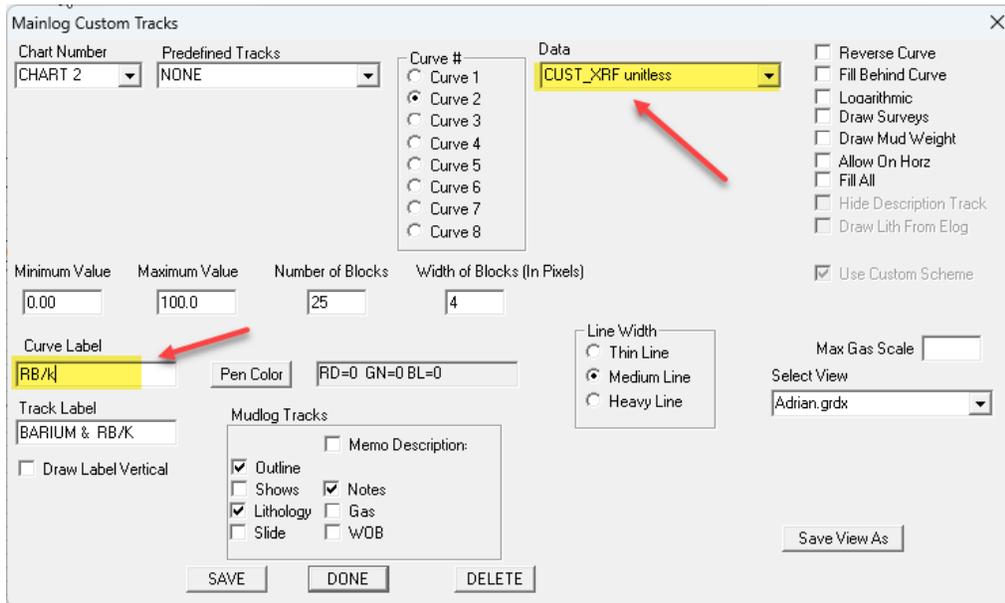
If previous XRF data was edited in the LAS file you can change the "**Import From**" depth, (click Enter or Tab) and a dialog check box will open to resend data on Wits Out from that depth. **Check the box to resend** data on Wits Out from that depth or leave unchecked to import without sending all out on wits.



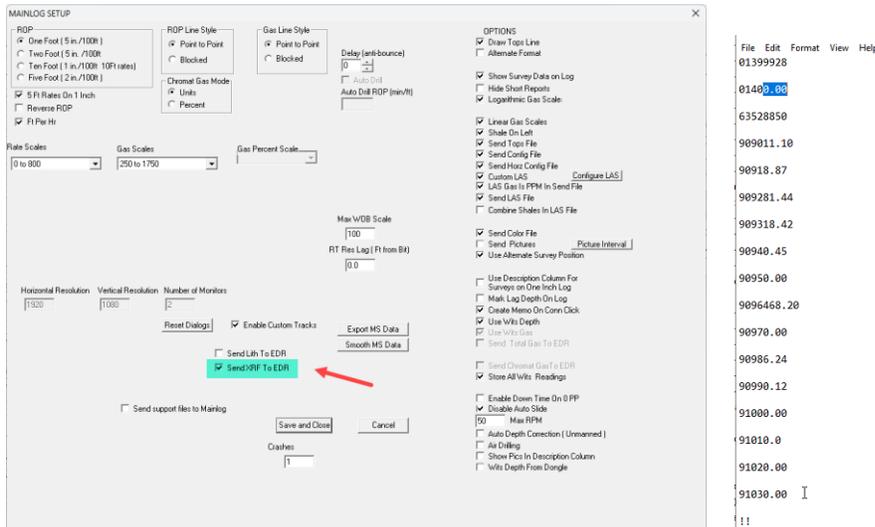
## XRF Wits Codes

9090	GR API
<b>9091</b>	<b>Dolo %</b>
9092	Calcite %
<b>9093</b>	<b>Total Clays %</b>
9094	Pyr %
<b>9095</b>	<b>Qtz %</b>
9096	Ba ppm
<b>9097</b>	<b>Halite %</b>
9098	QFM %
<b>9099</b>	<b>Total Others %</b>
9100	Rb ppm
<b>9101</b>	<b>Sr ppm</b>
9102	K20\AI203 unitless
<b>9103</b>	<b>TH\K20 unitless</b>
9104	Cust_XRF
<b>9105</b>	<b>Cust2_XRF</b>
9106	Cust3_XRF
<b>9107</b>	<b>Anhy %</b>
9108	TiO2
<b>9109</b>	<b>SO3</b>
9110	Ni

There are **Custom XRF Wits Codes**. With **Cust\_XRF**, **Cust2\_XRF**, and **Cust3\_XRF**, any element and/or ratio value can be assigned to these in the Custom Tracks dialog. When the item is entered and labeled on a custom track, they will be included in the LAS file.



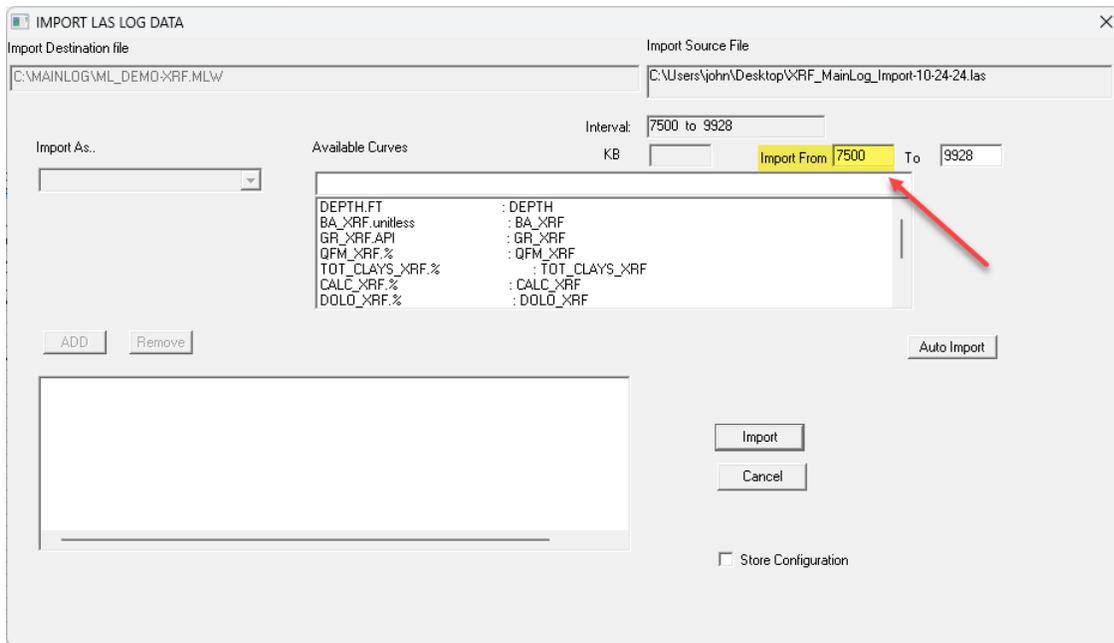
In Setup Lines and Scales, XRF data can be selected to be sent out via Wits.



When “Send XRF to EDR” is checked, anytime the XRF data is imported, MainLog will automatically send it out on Wits to the EDR. These will be added to the lag depth and total gas codes that are already being sent out. To verify the data is being sent, the text file witsData--Out@<current date>.txt located in the **c:\mainlog** folder will show the codes being sent.

**Note:** the EDR provider will have to add the XRF wits codes to their system.

To re-send any XRF data, just re-import the data from the Import dialog typing in the depth you wish to start from. If you have already stored the configuration, select “Auto Import” and the data will be sent, via Wits, from that depth.



## XRF Trouble Shooting

Should importing fail or close MainLog, try manually re-importing each item again and **Store Configuration**. If that fails, close MainLog and go to the **c:\mainlog** folder and delete the **< filename.xrf >** file. Open MainLog and reimport. If there is still an issue it may be in the LAS itself. Please e-mail us at [admin@mainlog.com](mailto:admin@mainlog.com) and send us the “<filename.ML\_>” from doing a “sendfile” and also attach the LAS file you are importing from.

## Import ROP from text File

Rate of Penetration (ROP) can be imported as a text file. The first column in the text should be depth in one-foot increments. The second column assumes the ROP is in FPH. (Feet per Hour) If the ROP is in Min/ft the first line must contain “min”, or “MPF”.

Click on ROP and from the dialog go to the text file to import the drill rates for the known depths.

\*roptext.txt - Notepad  
 File Edit Format View Help  
 A standard rop file created from pason is in FPH...NO HEADER FPH is assumed and MainLog will import as is

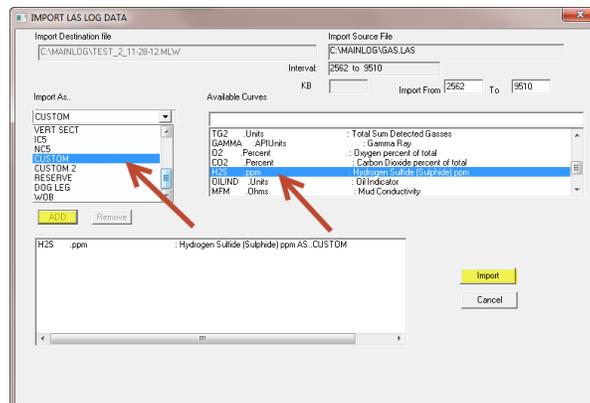
1000 25.2  
 1001 30  
 1002 32.6

If data is **Min/per/ft logger** must insert **Min or MPH** as the first line of the text file|

MPF  
 1000 25.2  
 1001 30  
 1002 32.6

## Import as Custom (H2S, Mud Temperature, etc.)

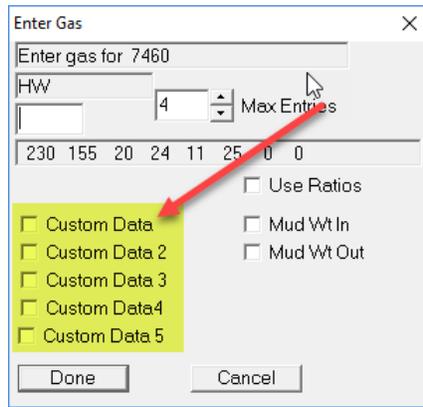
Data that is not read & plotted real time, such as H2S, can be imported via a LAS file. To display this data, it must be imported as a **“Custom, Custom 2, Custom 3 or Custom 4”**. From the **Import Menu** select **Import Mudlog Data**, browse and select the LAS file with the data and import it as **“Custom, Custom 2, Custom 3 Custom 4 or Custom 5.**



Select from the “curves” list box the curve you want to import and then match it to the curve “type” from the list box on the left, in this case as Custom or Custom 2. Click on the **ADD** button and that curve and type will be displayed in the selected list box. Click **Import**. Before importing, be sure the KB displayed is correct, if not; correct it in the edit box. ***For more information on importing Error! Reference source not found.***

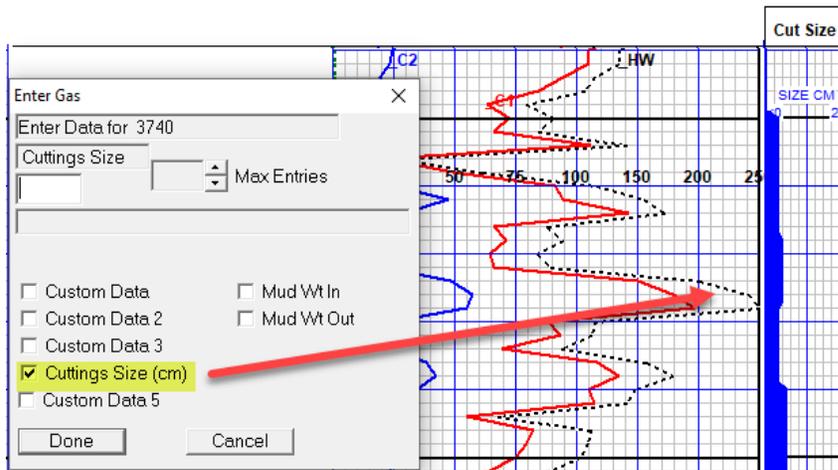
After importing, have the curve **displayed and labeled** on **Custom Tracks**. By labeling it in custom tracks as H2S, MainLog will put the H2S values in the LAS file when created. See **Custom Tracks**.

**“Custom Data”** such as H2S values or any other imported custom data can be edited or entered in manually through the gas edit dialog by checking the box.

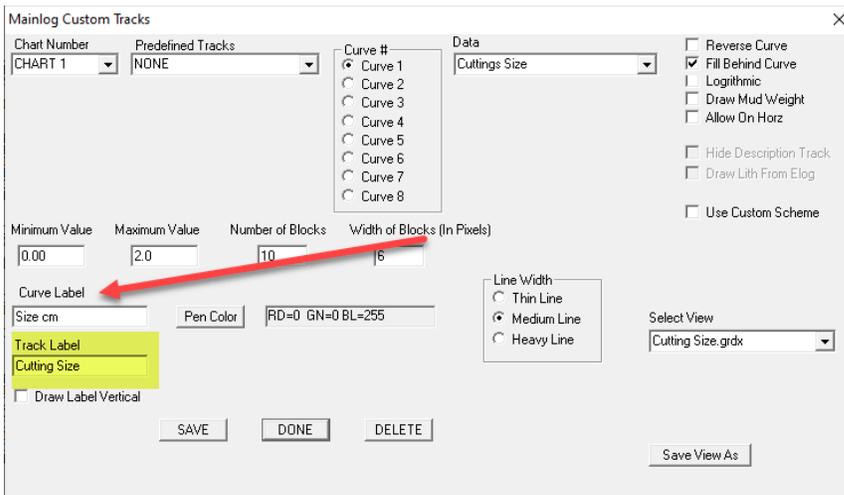


## Cuttings Size

Cutting Size can easily be set up on a Custom Track and entered in as a **“Custom Data”** from the **Gas Edit Dialog**. There are a few logging companies who do work for Pioneer Natural Resources. If those companies are in the header file, MainLog will automatically use **“Custom Data 4”** as **Cutting Size (cm)** in the Gas Edit Dialog.

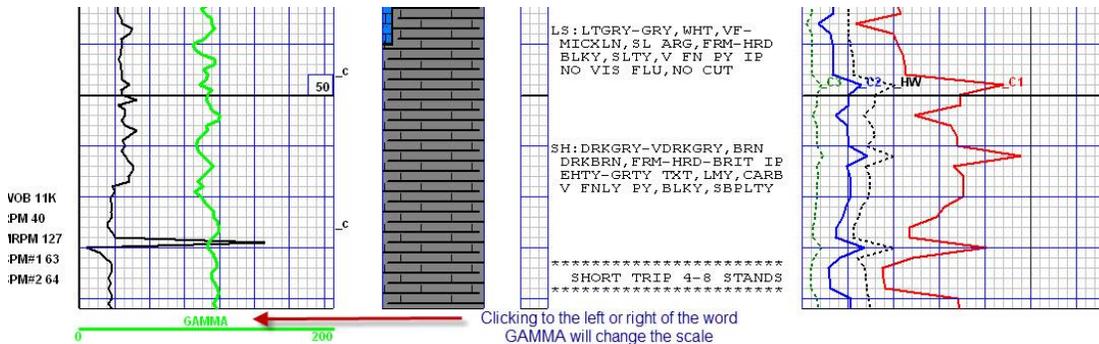


If the “Track Label” is listed in the Custom Tracks dialog, then the label and values will be added to the LAS file.



### \*GAMMA SCALE (Available in Office mode)

The various scales are hard coded, except for the gamma scale. The gamma scale can be changed by double clicking in the space between the bottom of the ROP grid, and the line for the gamma scale text below the ROP grid. Clicking to the left of the word gamma, will select the next scale lower. Clicking to the right will select the next scale higher.



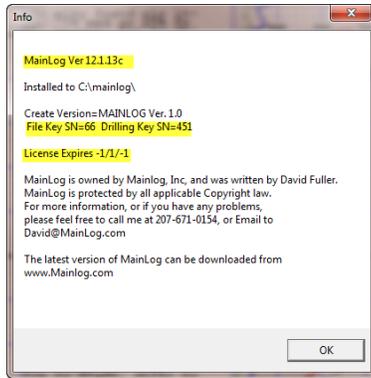
## Help Menu

By clicking on **Help** the following selections are available: **About and MainLog Manual**

### About

About give the version of MainLog currently installed on the computer, the Serial number of the drilling key and the date the license expires. It also has contact

information to MainLog.

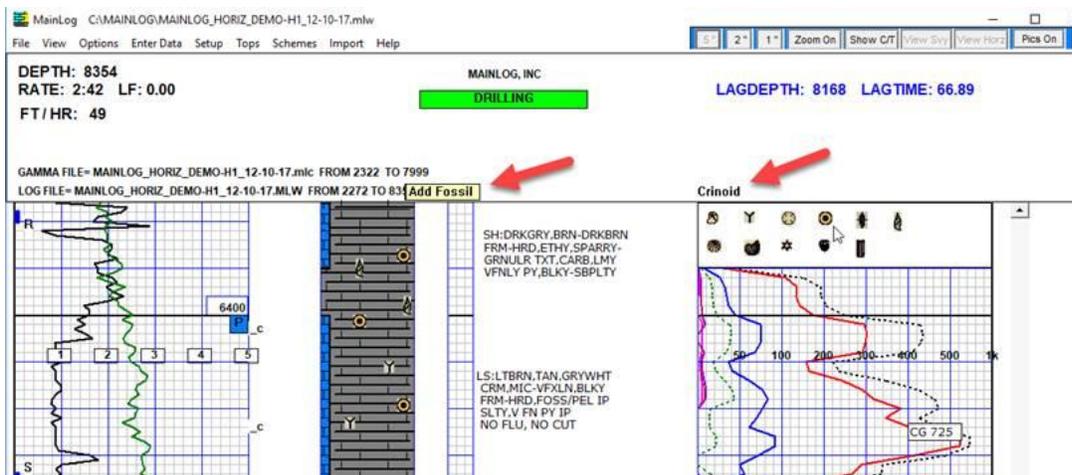


## MainLog Manual

This opens a PDF file of the “Basic” version of the MainLog Manual. This version does not have all the screenshots that are available from downloading the manual from the MainLog Website. It is recommended that the full version be downloaded and placed on the PC desktop for easy access. The date of the manual is on the website under “Downloads”, as well as, on the first page of the document. <http://www.mainlog.com/download.htm>

## ACC (Accessories)

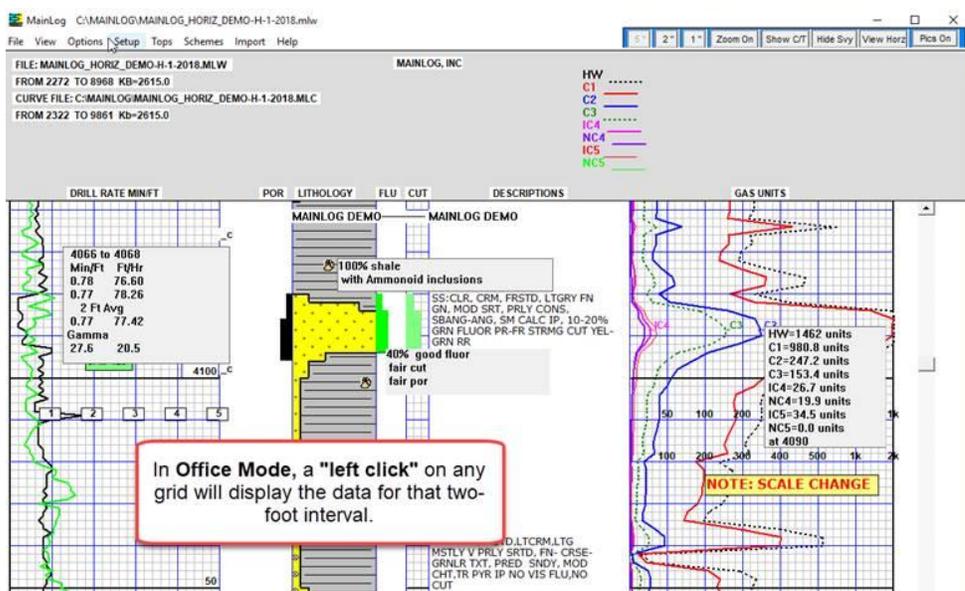
The “Acc” (Accessories) button in the lithology column is a quick way to insert symbols, such as, fossils, coal, pyrite, etc. into the lithology column. Click on “Acc” and the accessory dialog opens. When panning over a symbol the name of the accessory will be displayed over the dialog box, as shown below.



Left click on the symbol or accessory to be pasted and then left click in the lithology column where you want the symbol displayed. **By holding down the “ctrl” key**, you can add that symbol multiple times. When done, let go of the control key, and either select another accessory to paste or click on the “Close” button to close the dialog. Note the “Acc” button toggles to the “Close” button after selecting.

Once a symbol is in the lithology column you can move it by “left click and dragging” it to the position you want. (*\*Grab the bottom half portion of the symbol*) To delete a symbol just “left click and drag” it off the lithology column and it will be deleted. Note that only one symbol can be placed in a two-foot interval. If you try to place a symbol on a line that already has one, MainLog will replace the symbol with the one you positioned there.

If you are only e-mailing PDF’s of the log to a client, the symbols will be printed on the log. If you are sending the actual log, “filename.ML\_”, to your client, they will have to update the Office Version of MainLog to see the symbols. Also, in case you did not know, a left-click on any grid in Office Mode, will display the data for that two-foot interval. This includes displaying the name of the fossil that may be there. Please let your clients know who use the MainLog in the office.



## Down time and Circulating time

The best down-time control is an off-bottom switch that can be wired to the depth box provided by MainLog if the gas monitor system is enabled. **To stop the counter and enter downtime, hold down the Ctrl key on your keyboard and press D.** A message at the top of your screen will say: **Down time 00:00:01**. The counter will

then run until **Ctrl-D** is depressed again, or a foot drills, which will take you out of down time.

While in down time, you can also press **Ctrl-C**, which will put you in circulating time. This will allow your lag depth to run while stopping the drill rate counter. After pressing **Ctrl-C**, another counter under the down time counter that will say: Circulating time 00:00:01. To stop the counter, depress **Ctrl-C** once again and the counter will disappear. Once in down time or circulating time, a foot being drilled will exit down time and drilling mode will resume. One exception to this is your delay time in lines and scales. If you engage downtime with less time than your delay is set at, it will not drill out of downtime. Downtime will then have to be disengaged manually. If using Strokes to track lag, circulating is tracked automatically.

## **Gas Detection Equipment**

MainLog reads and plots gas real-time from a variety of instruments. These Include:

### **FID'S**

Baseline FID  
Paladin FID  
SRI FID  
Terra FID  
Varian FID

### **Instruments w/Data Acquisition**

Analytical  
BlueRay  
DAQ  
Series 2000

### **WITS**

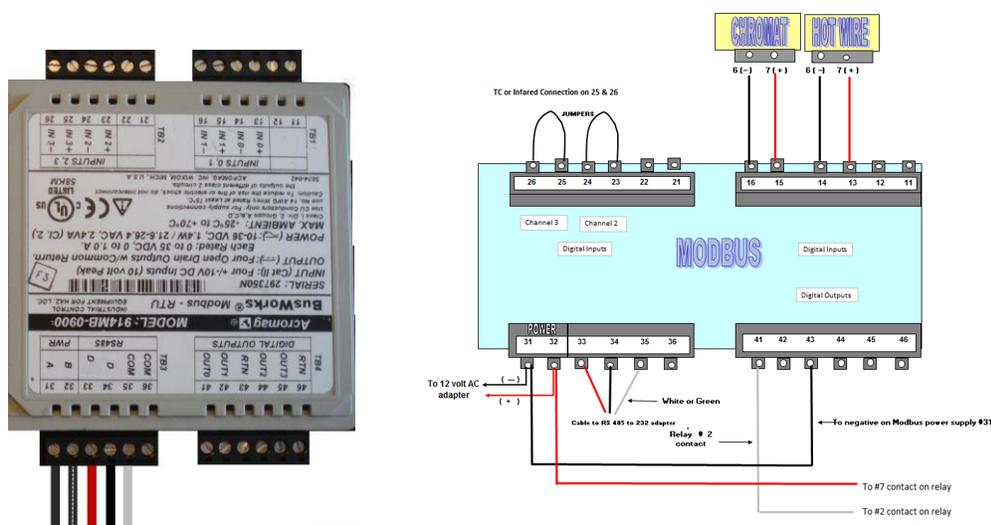
Bloodhound  
Pason Gas

Rig Rooster  
 Terra Red Box  
 Totco Gas...requires configuration from Totco

\*\*MOST instruments sending gas via Wits

Instruments that send gas values via a WITS feed require no additional hardware other than possibly a USB to Serial Adapter (we recommend a Triplite Keyspan adapter), TCP cable or a Printer Cable. Other instruments that MainLog reads directly from a filament, require an **analog to digital** interface. MainLog uses an Acromag Modbus which has multiple input and output connections as shown below.

### Acromag Modbus



Following are setup instructions for several types of gas detectors that MainLog reads from. These are the settings to use in MainLog to connect to the instruments and are not instructions for setting up the instrument itself.

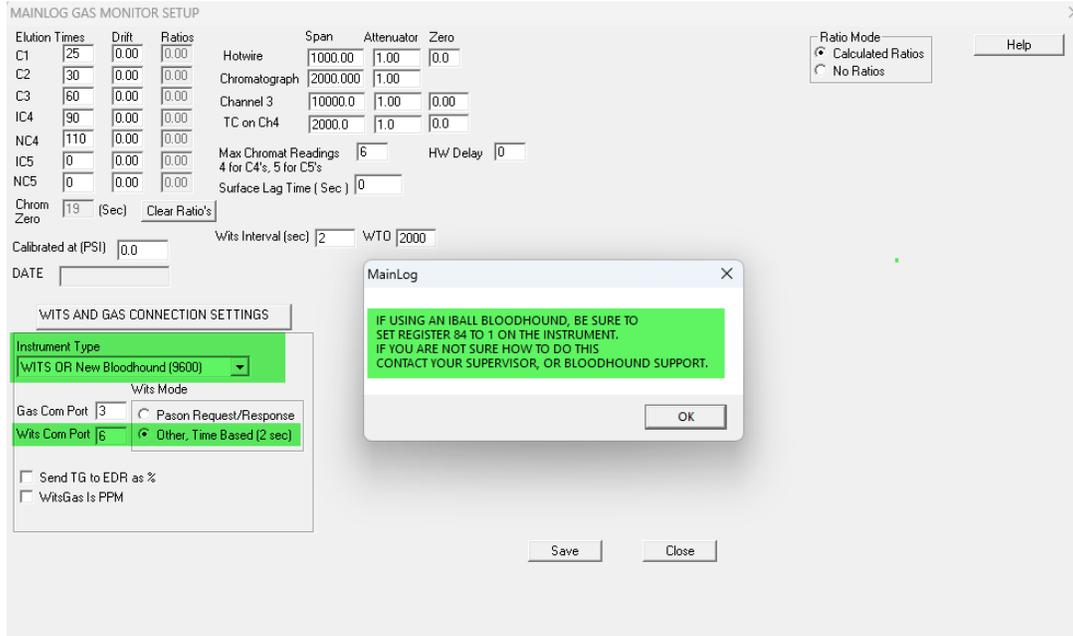
### Bloodhound Gas Detector

## Setting Up MainLog Software to Use the Bloodhound

In MainLog from the **Gas Monitor Setup**:

- Under “**Instrument Type**”: Select “**WITS OR New Bloodhound (9600)**”
- Set WITS com port the Bloodhound is on (Find in Device Manager, should say Silicon Labs)

- Set WITS to “**Time Based (2 sec)**” (always, regardless of EDR provider)
- Save & Close



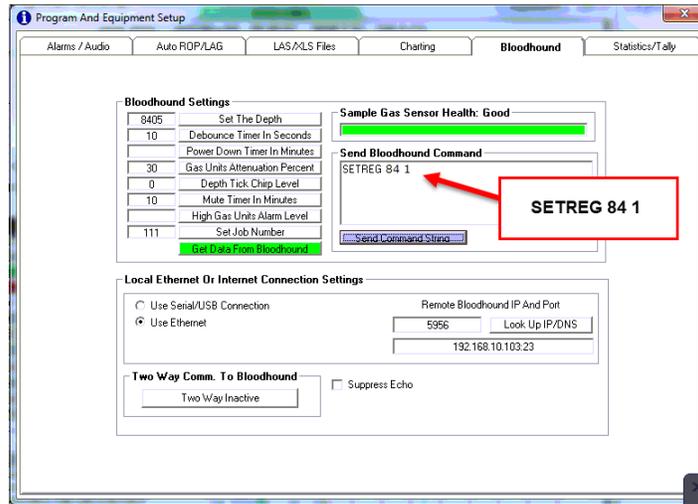
### From Setup\Lines and Scales

- OPTIONS (If available)
- Check on “**Use WITS Gas**”
- Check on “**Use WITS Depth**”
- Select “**Save and Close**”

### From Options

- Check **WITS/GAS MONITOR**
- 

**With MainLog the new Bloodhound requires setting Register 84 to 1.** To do this from the Bloodhound Software, go to the “**Program & Equipment Setup**” and select the “**Bloodhound**” tab. Type in, **SETREG 84 1**, as in the example below.



**\*\*\*NOTE: If these setting do not work with Mainlog, you may have an old Bloodhound which requires the setting Register 84 to 0.**

**\*\*\* Note: With the Bloodhound, MainLog does not Wits Out Total Gas, only Lag Depth.**

### Baseline TGA with MainLog

If the Baseline output is in mAmps, a resister must be used across **13-14** on the Acromag to convert to mVolts. For this discussion, we assume output is 0-10 volts, or 0-10000 mv. **The TC on channel 4 span must be 1, and AUTO TC NOT checked.** These headings may have change when you see this.

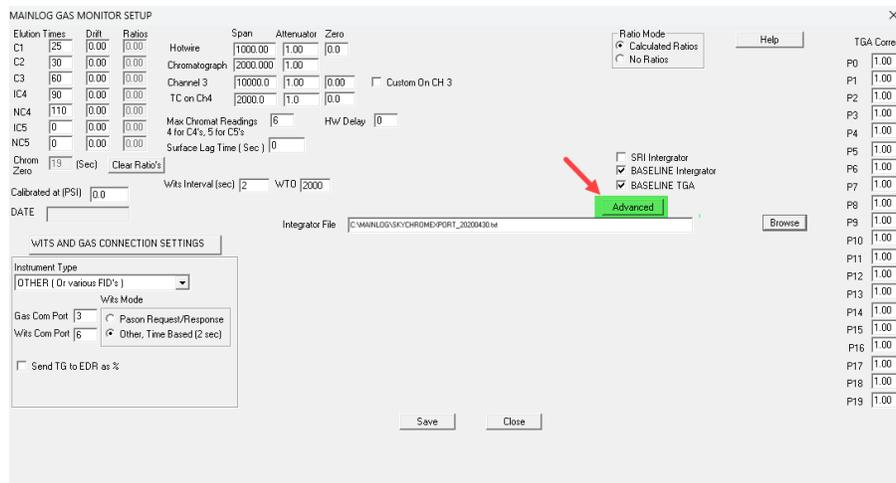
The output from the TGA (8800) **must connect at 13-14** on the Acromag, Polarity matters, and if increase gas causes a negative change in MV, reverse the wires.



The HW span is used to adjust the sensitivity, (starting at 1000 +/-) and sync Mainlog to the 8800 at low gas readings. It is possible that is all that needs to be done. However, we have found that the 8800, (and other TGA's) are not linear from low to high gas. To correct, we have a 20-point correction system, used as follows.

Flow 1% methane across the TGA and set the HW span so Mainlog reads what you want to calibrate to, assume either 100, or 50 units for 1%.

Then click on **Advanced**, and you will see 20 correction windows. The first should be 1. Increase gas to 5% across the TGA, adjust the number up or down on the next window, so that 5% gas reads correctly. Do the same for each 5% increment in the calibration gas.



Once set correctly the values should not need to be changed unless/until a significant change in the TGA calibration, or setup.

## MainLog Settings - Baseline Integrator

- In the Gas Monitor Set-up the “**Instrument Type**” should be set to “**Time Based (2 sec)**”
- Check the box **Baseline TGA**
- Check the box **Baseline Integrator**
- In the “**Integrator File**” box, browse to the location where the FID will be copying the gas results to. We recommend the results be copied to **c:\mainlog\gas** which will be set in the SkyChrom software.
- Test Gas Values need to be set to **50 or 100 depending on how you calibrate for each component gas.**
- **If also wanting to display TGA as a percent, HW/TGA test gas value should also be set appropriately**

MAINLOG GAS MONITOR SETUP

Elution Times	Drift	Ratios	Span	Attenuator	Zero
C1	25	0.00	1000.00	1.00	0.0
C2	30	0.00	2000.000	1.00	
C3	60	0.00	10000.0	1.00	0.00
IC4	90	0.00	2000.0	1.0	0.0
NC4	110	0.00			
IC5	0	0.00			
NC5	0	0.00			

Hotwire: 1000.00, 1.00, 0.0  
Chromatograph: 2000.000, 1.00, 0.00  
Channel 3: 10000.0, 1.00, 0.00  
T.C. on Ch4: 2000.0, 1.0, 0.0

Max Chromat Readings: 4 for C4's, 5 for C5's  
Surface Lag Time (Sec): 0  
HW Delay: 0

Ratio Mode:  
 Calculated Ratios  
 No Ratios

Wits Interval (sec): 2, WTO: 2000

Calibrated at (PSI): 0.0  
DATE: [ ]

Integrator File: C:\MAINLOG\SKYCHROME-PORT\_20200420

WITS AND GAS CONNECTION SETTINGS

Instrument Type: OTHER (Or various FID's)

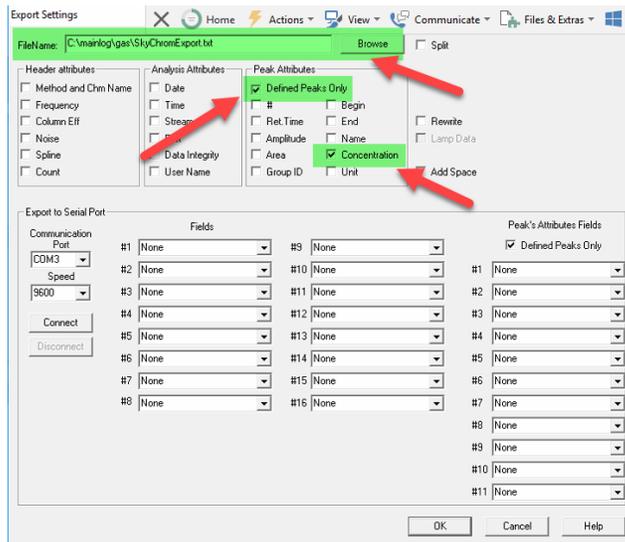
Wits Mode:  
Gas Com Port: 3  
Wits Com Port: 6  
 Pason Request/Response  
 Other, Time Based (2 sec)

Send TG to EDR as %

Buttons: Save, Close

## Baseline Setup for Mainlog in SkyChrom

- In **Export Settings** in the SkyChrom program, the only boxes to be checked are “**Defined Peaks Only**” and “**Concentration**”.
- In the **Filename** box we recommend the results be copied to **c:\mainlog\gas**



The Baseline results file will be in the following format:  
C1 thru NC5 in PPM.

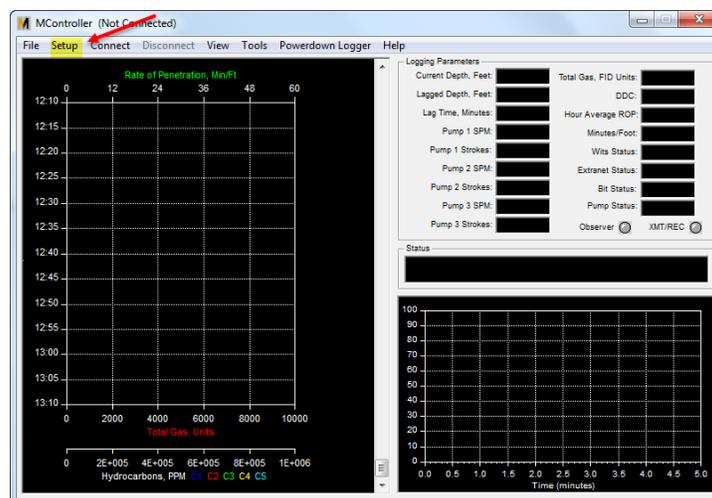
SkychromExport\_20181119.txt - Notepad

```
File Edit Format View Help
| 11520      6660 2640 1000 460 260 250
```

## RedBox Gas Detector

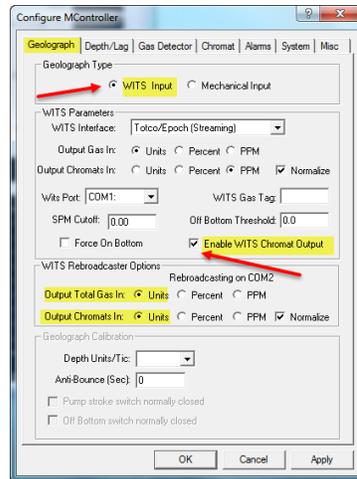
When using the Redbox the following setting should be used:

From the M-Controller software click the “Setup” tab.



From the “Geograph” tab choose the following:

- **“Wits Input”**
- **Enable WITS Chromat Output** (sends Chromat data out to both WITS ports; One to MainLog & one to the EDR)
- **Check Output Gas and Chromats to “Units”.**



In MainLog, from the **Gas Monitor Setup**:

- Under **“Instrument Type”**: Select **Terra SLS**
- Enter WITS com port (Find in Device Manager)
- **WITS Mode** should be set to **“Other, Time Based (2 sec)”** (always, regardless of EDR provider)
- Save & Close

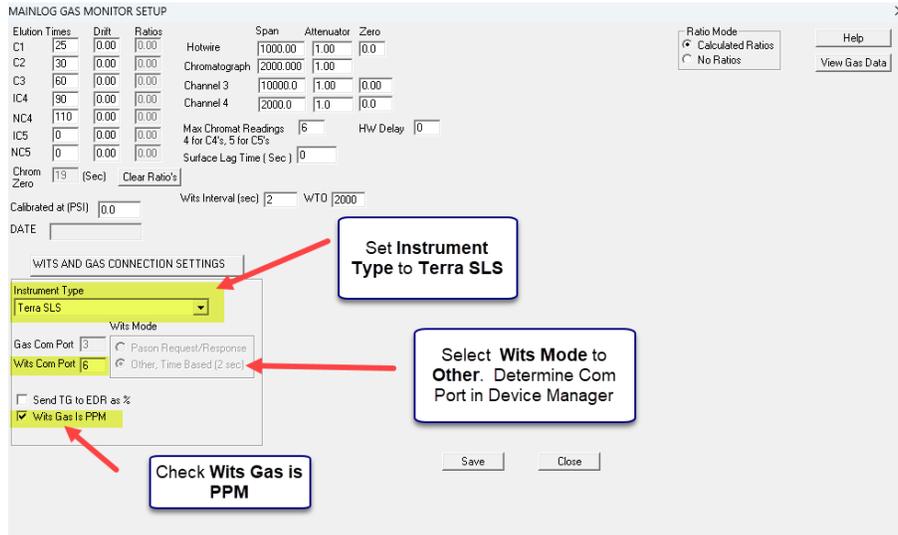
**\*\* From the “Setup” Menu, select “Test Gas Values” and make sure they are set to 100 units each. This is a must if the client is needing the gas values on the log to be in “Percent”.**

## Terra SLS FID Settings

In MainLog, from the **Gas Monitor Setup**:

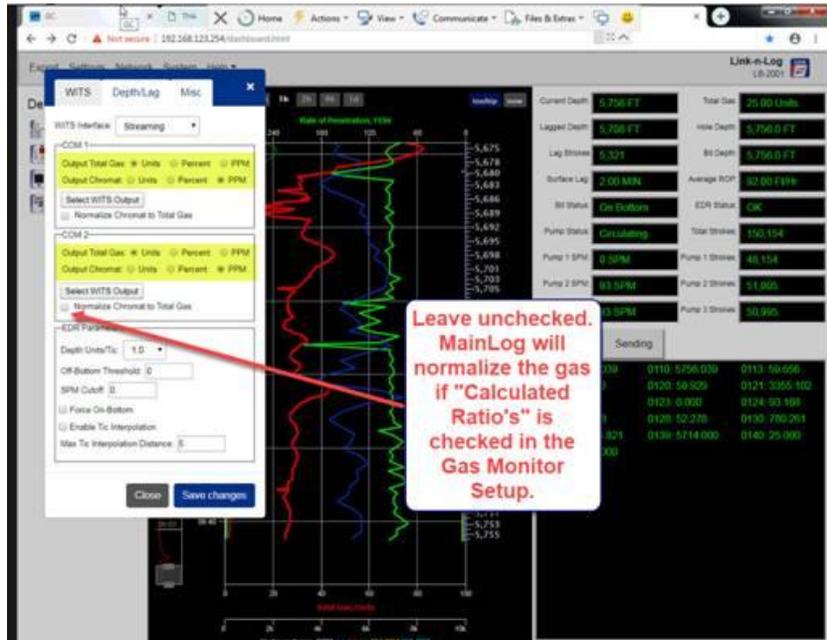
- Under **“Instrument Type”**: Select **Terra SLS**

- Enter **WITS** com port. (Find in Device Manager)
- **WITS Mode** should be set to “**Other, Time Based (2 sec)**”. (always, regardless of EDR provider)
- From the **Terra SLS Instrument Program** check the “**Output Chromat**” setting. If in **PPM**, then check the box “**WITS Gas is PPM**”, if set to **Units**, leave this unchecked.
- Save & Close.



From the **Terra FID** software, on the **WITS** tab:

- **Output Total Gas** should be **Units**
- **Output Chromat** can be **PPM or Units** but make the appropriate setting in MainLog’s **Gas Monitor Setup** to match the setting here.
- **Uncheck** “**Normalize Chromat to Total Gas**”. MainLog will normalize the gas if “**Calculated Ratio’s**” is checked in the Gas Monitor Setup. If “**No Ratio’s**” is checked in MainLog then the raw Chromat reading will be used.



**\*\* From the “Setup” Menu, select “Test Gas Values” and make sure they are set to 100 units each. This is a must if the client is needing the gas values on the log to be in “Percent”.**

"TG" on the first line, is the current total gas reading.

The "Gas" values in the MainLog Wits Gas Monitor are the raw numbers from the FID

TG	C1	C2	C3	IC4	Nc4	IC5	Nc5	C02	Run
468	345	283	181	58	38	7	12	2.88	1
751	0.46	0.27	0.14	0.07	0.04	0.01	0.02	7	

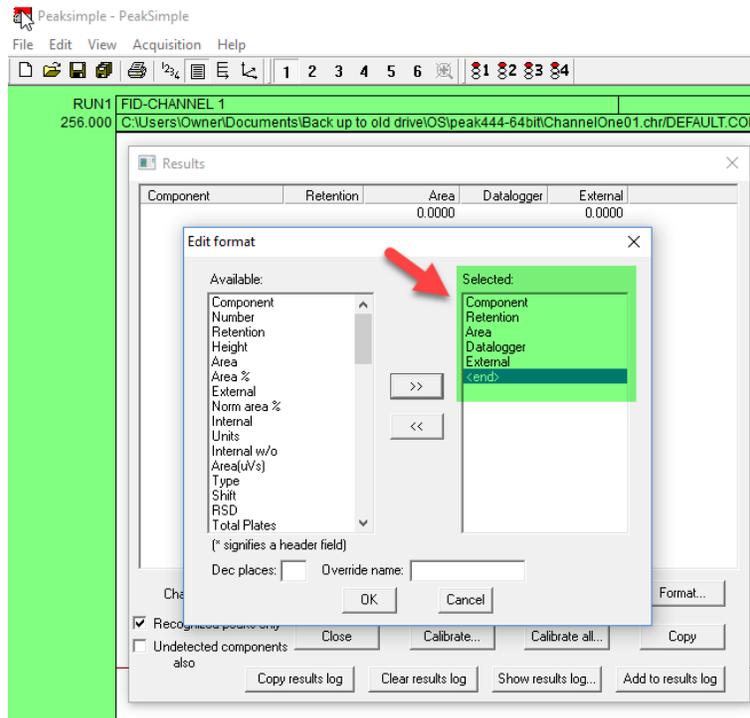
"TG" on the second line, is the combined total of the chromat gases

The second line displays the percent of each of the total gas.

## SRI Gas Detector

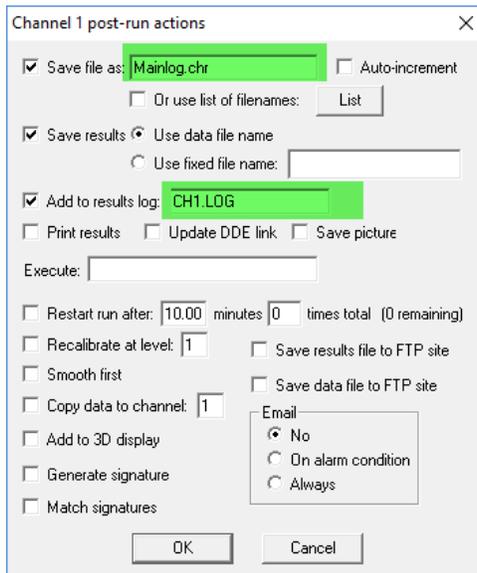
It is the **logging company's responsibility** to setup and calibrate the SRI equipment, as we at MainLog are not responsible or educated in that process. We do, however, know certain settings within the Peak Simple Software that are required for MainLog to read and plot from the SRI. **It's also worth noting that some clients may have slightly different settings than these. Please ask your supervisors or equipment techs to verify.**

From Peak Simple, click on **View\Results** then **Format**. From the “Edit Format” dialog the selected values should be **Component, Retention, Area, Datalogger** and **External**. They must be set in that order as shown below.



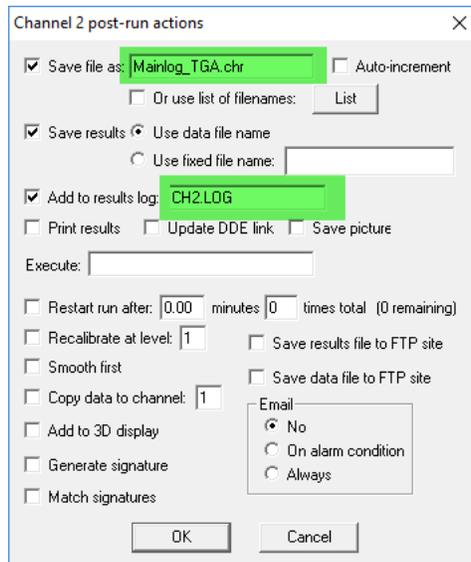
MainLog reads the 5<sup>th</sup> column, “External”, which is **PPM** from the “chromatograph results file.” The “Datalogger”, (column 4), is read from the “TGA results file”.

From Peak Simple, the Post-Run file names must be entered in the **FID-CHANNEL 1** and **TGA-CHANNEL 2** dialogs. Click on **Edit/Channels**, from **Channel 1: FID-Channel**, click on **Postrun**. The “Save file as” can be named anything but must have a “.chr” extension. The “Add to results log”, must have a “.LOG” extension. Check the boxes as shown below.

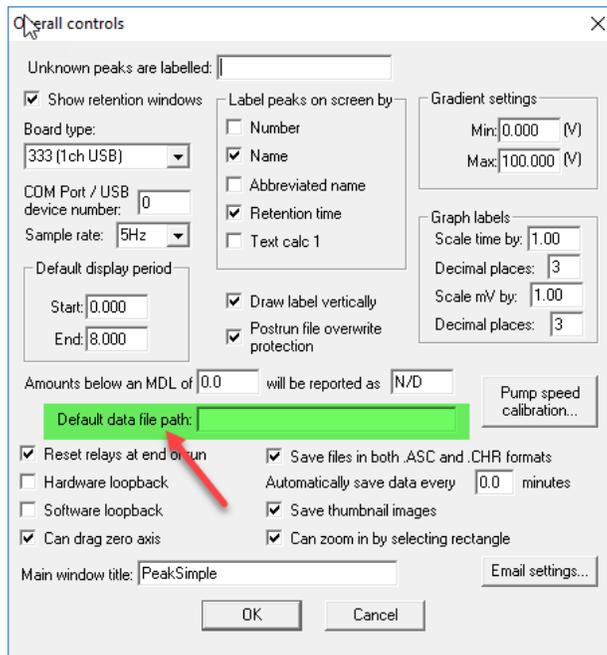


Under **Edit...Channels...** **“Channel 1...Details”** tab, the **Datalogger** should be **off**.

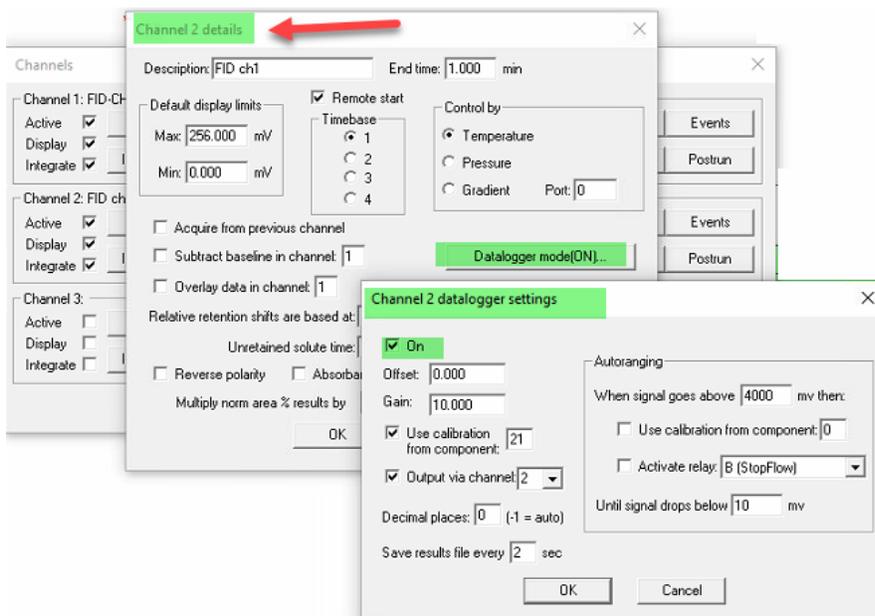
**Channel 2** is for the **TGA** and uses the setup below. On **Channel 2-Postrun**, the **“Save file as”** **must be named “Mainlog\_TGA.chr”**. The **“Add to results log”** must be named different than the Channel 1 results, but still have a **“.LOG”** extension. Check the boxes as shown below.



In Peak Simple go to **Edit/Overall**. The **“Overall Controls”** dialog should have the following settings. The **“Default data file path”** is where the results files are placed. If **no path** is entered here, by **default they go to the Peak Simple folder and that is what we recommend**.



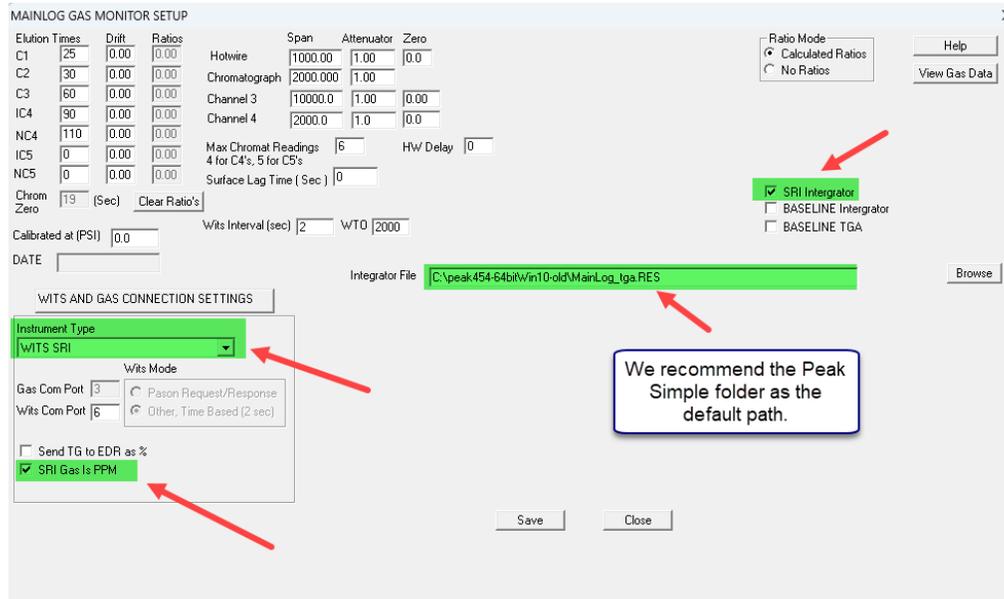
Under **Edit...Channels...** “**Channel 2... Details**” tab, the **Datalogger** should be **ON**.



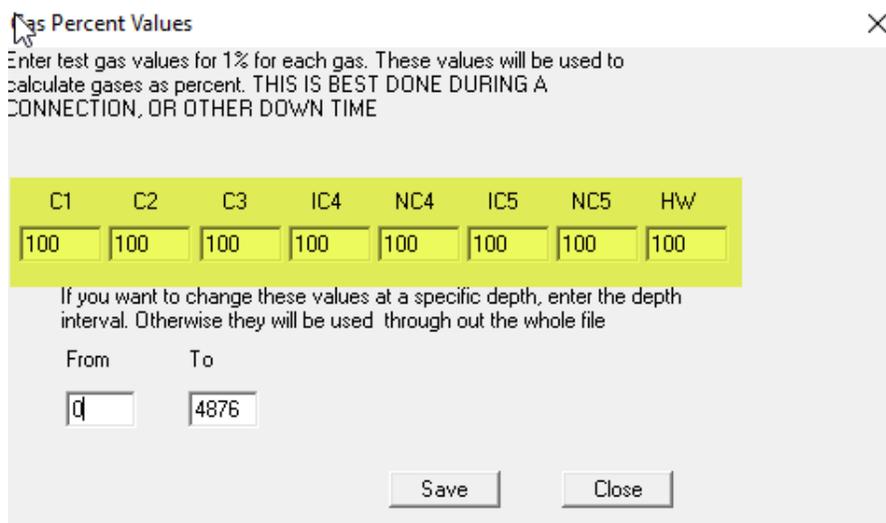
The following settings in MainLog are required to read and plot gas from the SRI. From the **Gas Monitor Setup** implement the following:

- Set Instrument Type to **WITS SRI**

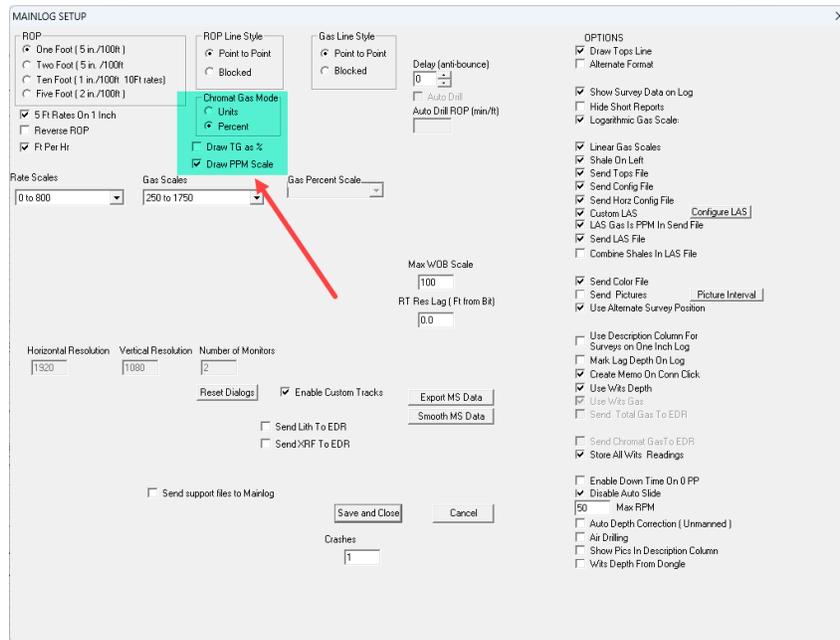
- The box, “SRI Gas is PPM” is defaulted to “On” for most clients and grayed out for others. **These are read from the 5<sup>th</sup> column “External” in the results file.**
- Check the box, **SRI Integrator**



- **With PPM selected, you must also set the Test Gas Values in MainLog under Setup/Test Gas Values.** Each value must be 100 if 1%=100.



- On the log results can be displayed in units, if PPM is required, go to **Setup\Lines and Scales** check the box “**Percent**” under **Gas Mode**, and “**Draw PPM Scale**”.



When properly set up the results (shown in red), for the Chromatograph and TGA should be posted in the following formats.... Please note: **“Run 1” must be the last line of text before the results data.**

### Chromat Results

```
SRI Instruments
Valued Customer
N2024

06/23/2013 12:42:58
Syringe Injection

FID-CHANNEL 1
RESTEK 15METER MXT-1
HELIUM AT 5 PSI
C:\Peak426-32bit\MLS.TEM
C:\Peak426-32bit\MLS.evt
mls.cpt
98.0, 5.0, 0.05, 1.000, 1.000,0
DEFAULT.CON
MAINLOG02.RES|
RUN1

"C1",0.293,280.5300,907
"C2",0.320,140.4180,227
"C3",0.370,88.0330,113
"IC4",0.460,22.3573,36
"NC4",0.490,15.5186,43
"IC5",0.696,17.2930,22
"NC5",0.750,25.2764,18
```

### Total Gas Results

```
SRI Instruments
Valued Customer
N2024

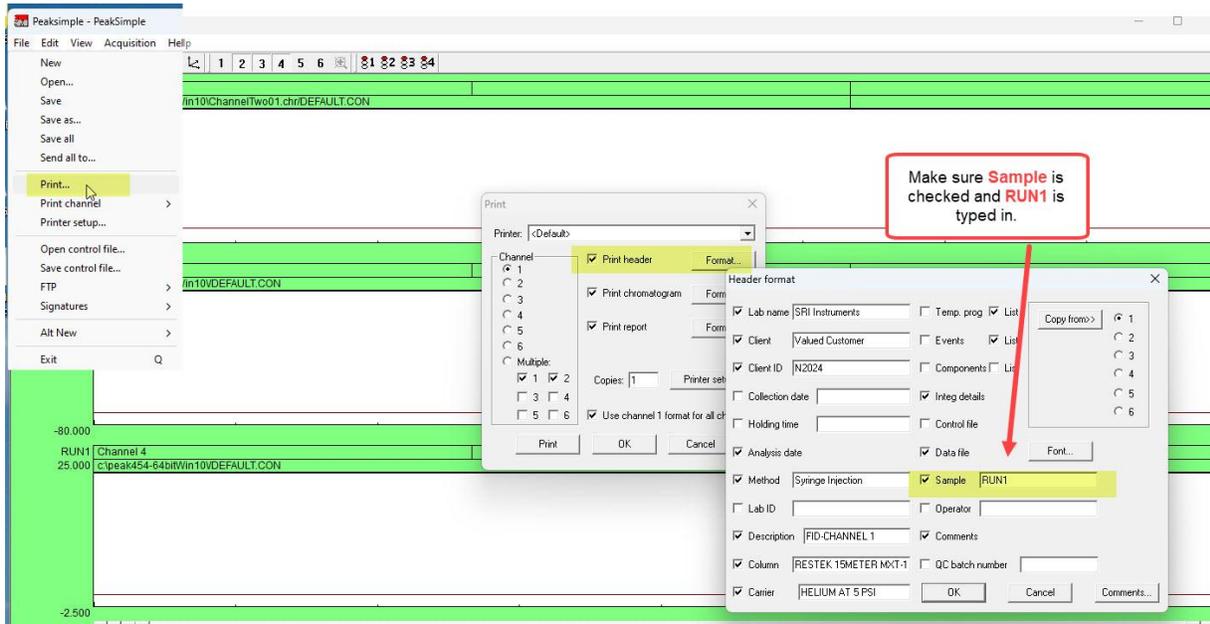
06/23/2013 12:42:58
Syringe Injection

FID-CHANNEL 2
RESTEK 15METER MXT-1
HYDROGEN AT 12 PSI
C:\Peak426-32bit\MLS.TEM
C:\Peak426-32bit\MLS.evt
Total Gas.cpt
98.0, 5.0, 0.05, 1.000, 1.000,0
DEFAULT.CON
MAINLOG_TGA.RES
RUN1

" TGA",0.293,600.5300,907
```

If the Results files do not show “RUN1” in the header right above the readings they will not plot on the log. To edit the header in PeakSimple go to **File/Print/Print header Format** and check the box **Sample** and type in **RUN1**

and click OK. This will add RUN1 to the header and will fix the issue. **\*Note that no information should be plugged into “Operator” in the dialog.**



## SRI WITS Extended Channels 3 thru 5

The SRI instrument has six channels and in conventional mudlogging, usually only channels 1 and 2 are being used, however, if addition sensors/devices are being used on channels 3 thru 5, MainLog can read and plot those on custom tracks. These would replace custom items 3 ,4 and 5 in MainLog. The data coming in can be seen in the MainLog WITS Monitor on row three.

MAINLOG WITS MONITOR ( SRI )								
TG	C1	C2	C3	IC4	Nc4	IC5	NC5	Run
7000	99	80	37	33	20	20	18	1
RATIOS OFF								
CH3	105.4	CH4	300.4	CH5	284.4			

A red arrow points from a red box labeled 'SRI WITS Extended Channels' to the 'CH3', 'CH4', and 'CH5' data row in the table.

On Channels 3, 4 and 5 under the Postrun tab, the “Save file as” **must be named Mainlog\_CH3.chr, Mainlog\_CH4.chr and Mainlog\_CH5.chr. respectively.** The “Add to results log” must be named different than the Channel 1 results, but still have a “.LOG” extension.

## Pason GAS Detector

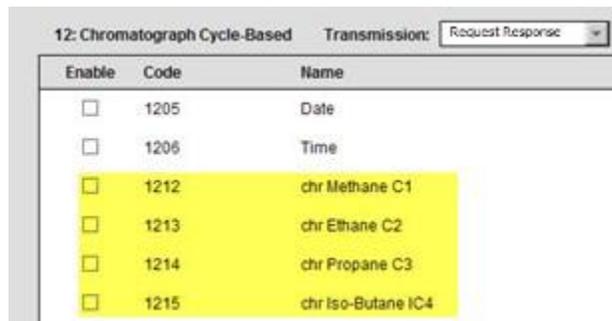
In MainLog set the Instrument Type to “WITS or New Bloodhound (9600)”

and set it to the correct com port. Set the **WITS Mode** to **Request Response**.

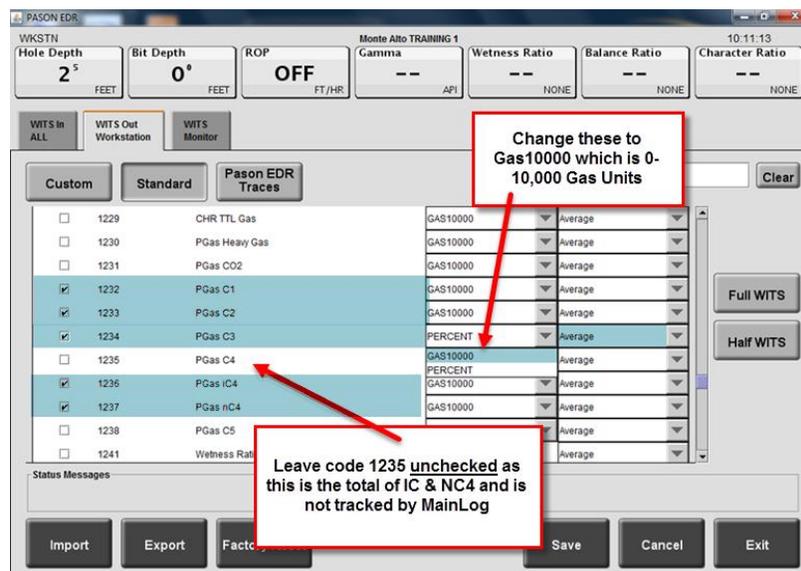
It is imperative that on the **Pason Workstation** that the **Transmission** is set to **Request Response**. It will not work properly if it's set to Time Based when using Pason Gas. On how to access the Wits dialog, see **Pason Workstation**

Also, from the Pason Workstation check the following:

- Make sure that **0170 - Pason Gas** is checked and that is set to **"GAS10000"** which is Gas Units.
- As you scroll to Chromatograph Cycle-Based codes you will find the following codes unchecked for the Chromatograph: **Leave them unchecked.**



- As you scroll down further you should find codes: **1232, 1233, 1234, 1235, 1236 & 1237**. **Except for code 1235 they all need to be checked and changed from "Percent" to "GAS10000" which is 0-10,000 Gas Units.**

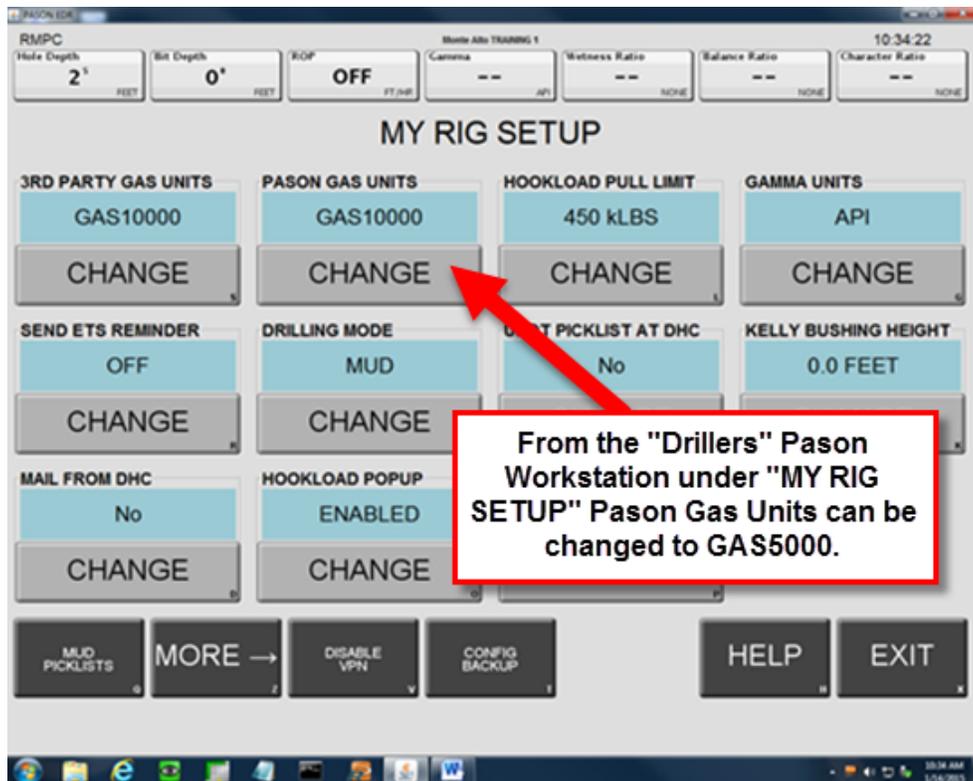


- **Code 1235** is the total of IC & NC4, however, MainLog ignores this code so even if it is checked it will not be read or plotted.

Click **“Save”** and **“Exit”**. You may need to close the **“WITS Monitor”** in MainLog and then reopen it. (Options\WITS or WITS\Gas Monitor)

**\*\*\*If you are not getting Pason Gas after making these changes, contact the Company Man on location to make sure that this add on service from Pason is turned on.**

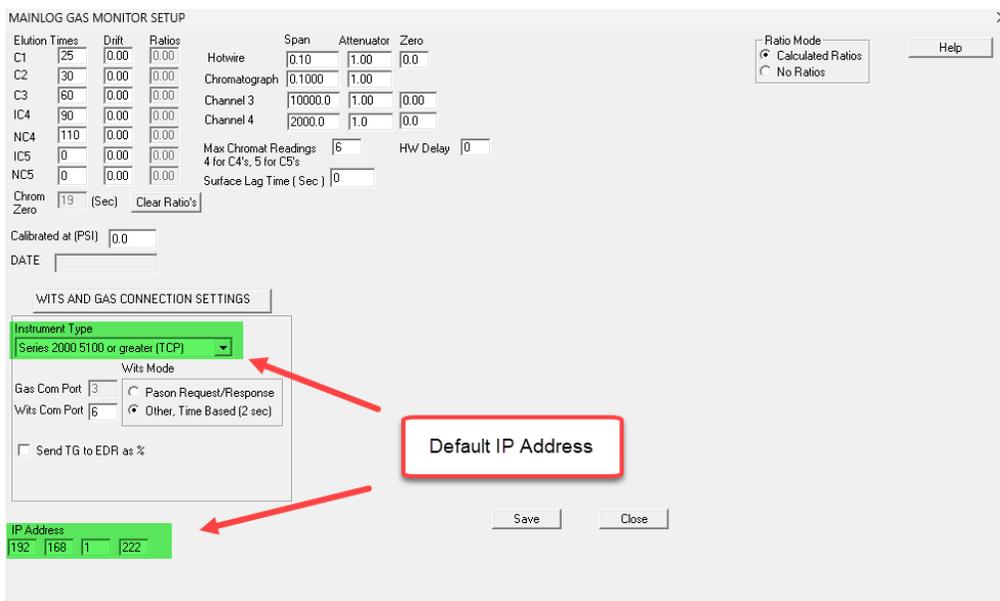
Pason Gas also allows for gas calibration of 0-5000 gas units. If this is a requirement; from the **“Drillers” Pason Workstation**, under **“MY RIG SETUP”**, the Pason Gas Units can be changed to **GAS5000**. (0-5000 units)



## Series 2000 PBI Instruments

In MainLog open the **Gas Monitor Setup**. Set the “**Instrument Type**” to Series **2000 5100 or greater (TCP)** –

- In the lower left-hand corner, the first two numbers in the IP address should be **192** and **168**.
- The Third number should be **5**, but it could be **1 on older instruments**. Whatever it is, it needs to be the same as the number in the Internet Protocol Settings. See “Internet Protocol Settings” below.
- The fourth number is **222** which is the instrument default. The fourth number in the Internet Protocol Settings must be different than 222.
- Elution Times must be set-up and Spans should be set to .10



- In Control Panel click on **User Accounts** and “Change User Account Control Settings”; Set to “Never notify”
- In Control Panel select **Folder Options**; under **View** tab Check “Show hidden files” and uncheck “Hide extensions for known file types”

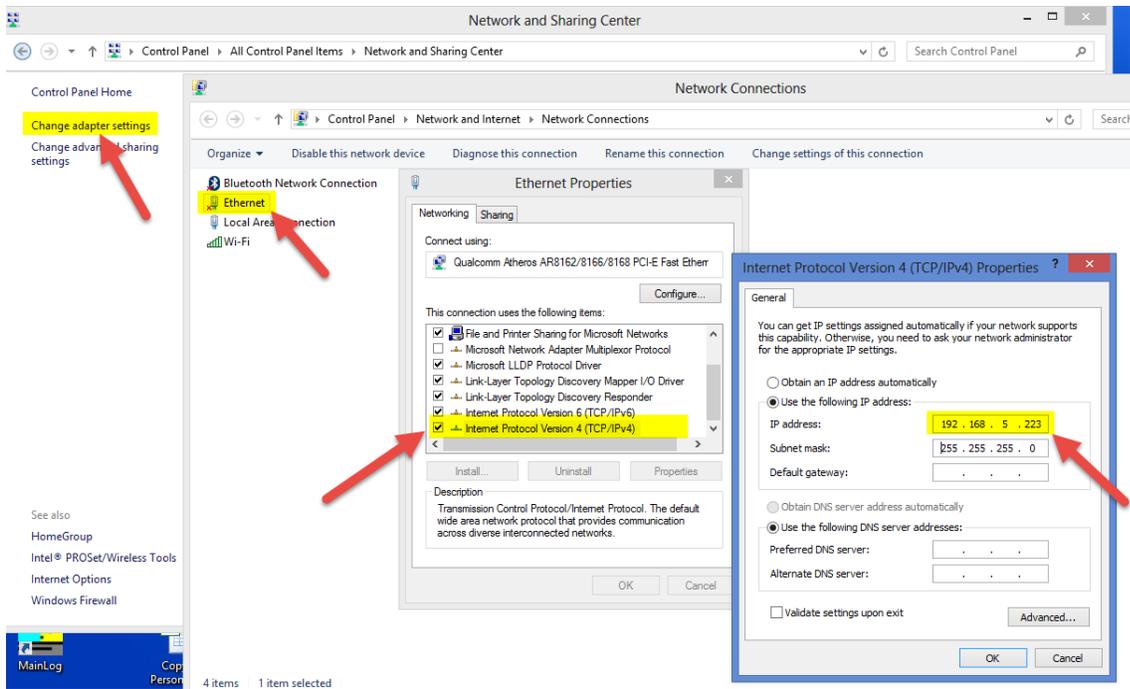
## Internet Protocol Settings

- Control Panel
- Network & Sharing

- Change Adapter Settings
- Local Area Connection – Ethernet (in Windows 8) - right click & properties
- Internet Protocol Version 4 (Highlight & click Properties)

**Check Use Following IP address:**

**192.168.5.223** (\*after typing in the 223 hit Tab Key on keyboard to populate Subnet Mask – should be 255.255.255.0) **If MainLog still does not connect with the instruments, try 192.168.1.223 in the adapter settings, and change the “5” to a “1” or “2” in the IP Address in the Gas Monitor setup. The first three numbers should be the same in the Gas Monitor Setup and Protocol Settings.**



**Settings in MainLog for Series 2000**

- In MainLog open the **Gas Monitor Setup**. Set the “**Instrument Type**” to Series **2000 5100 or greater (TCP)** –

- From the **Options** tab check **GAS Monitor**. Gas readings should be coming in on the **MainLog Gas Monitor**.

Mainlog Wits Gas Monitor								
TG	C1	C2	C3	IC4	Nc4	IC5	NC5	Run
540	254	198	100	90	110	4	5	8

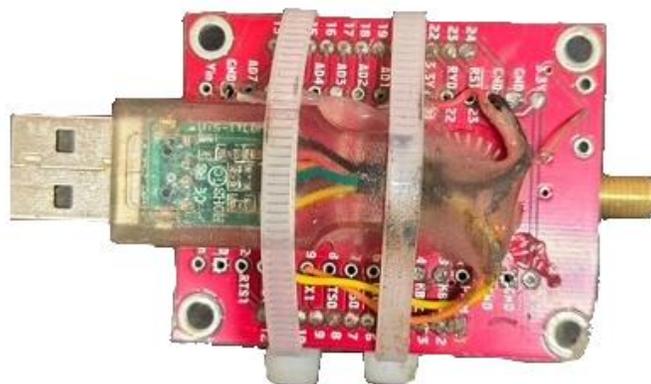
- If using a micro switch for depth, the depth and trigger come in on the TCP connection from the Series 2000 to MainLog.
- If an EDR is on the rig, then data can come in on the regular WITS feed using a Null Modem Cable to a USB to serial adapter from the EDR workstation to the computer. Determine the com-port and enter it in the Gas Monitor setup, next check WITS under the Options tab.

## RigRooster

RigRooster and MainLog software will run on the same computer, and **each will require two com ports** for a **total of 4 com ports**. If you don't have any serial ports on the computer, you will need **3 USB to Serial Adapters and two Null Modem cables**.

The **RigRooster (RR) gas detector sits at the gas trap** and transmits gas readings via a "Radio" to a receiver that is plugged into a USB port on the computer.

RIGROOSTER ANTENNA



The RR uses a second comport for sending the data via WITS to MainLog which is selected in the RR Software. This will require using a null modem cable going out one serial port on the computer and then back into the same computer on another port. If there aren't enough on-board serial ports it may require two USB to

serial adapters, connected with a null modem cable in between to complete the “circuit” to communicate with MainLog.

**MainLog** will use one port to connect directly to the EDR provider and one port to communicate with the RigRooster software on the return cable noted in the previous paragraph. We recommend using either Triplite Keyspan USB to Serial Adapters or D-Tech USB to Serial Adapters.

Setup the RigRooster first. From the Rig Rooster (RR) software on the “**Start**” tab, choose the com port that the radio sensor is plugged into. **Having Device Manager open when you plug it in will tell com port it is on.**

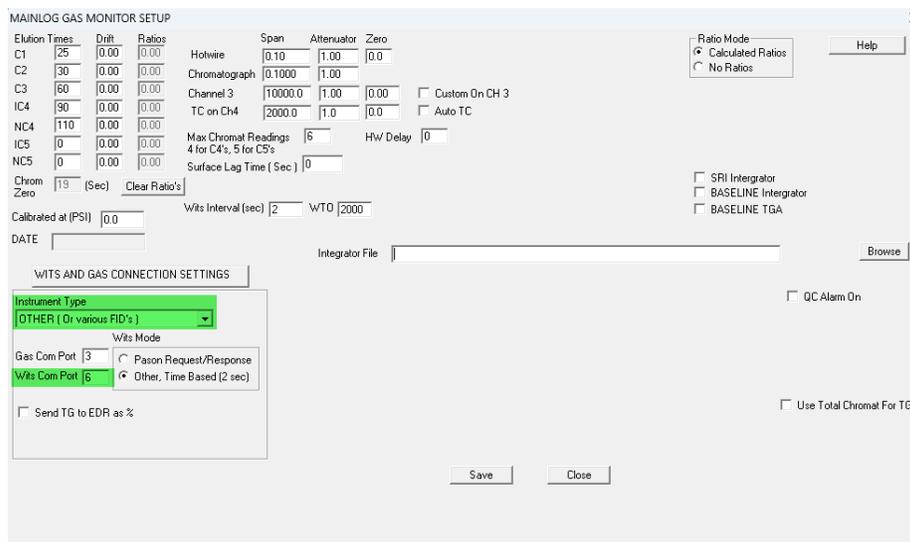


From the “**Wits**” tab on the RR software select one of the available com ports to send WITS gas out on.



The RigRooster sends the chromatograph in units. The sum of all chromatograph gases should always equal Total gas Units. RigRooster users can toggle Total Gas from the user interface to be sent as percent or units. This toggle has no effect on chromatograph gases as they will always be sent in units.

After setting up the Rig Rooster set-up the incoming WITS feed from the EDR to MainLog. From MainLog, in the **Gas Monitor and Wits Setup** dialog, set the **“Instrument Type”** to **OTHER (Or various FID’s)**. Select the proper **Wits Com Port** and **Wits Mode** for the EDR provider. **Again, open the Device Manager to see what com-ports there are**. Also check with your supervisor whether to use **Calculated Ratio’s** or **No Ratio’s**.



Next in MainLog go to **Options** and check **Wits Monitor**. You should have Wits from the EDR coming in. If you do not, check your **Wits Com Port** and **Wits Mode** in the Gas Monitor setup.

MainLog will receive gas readings from the Rig Rooster on the **Custom Wits** com port in MainLog. From MainLog, go to **Setup \ Setup Custom Wits Feed or (Paladin FID Setup)**.

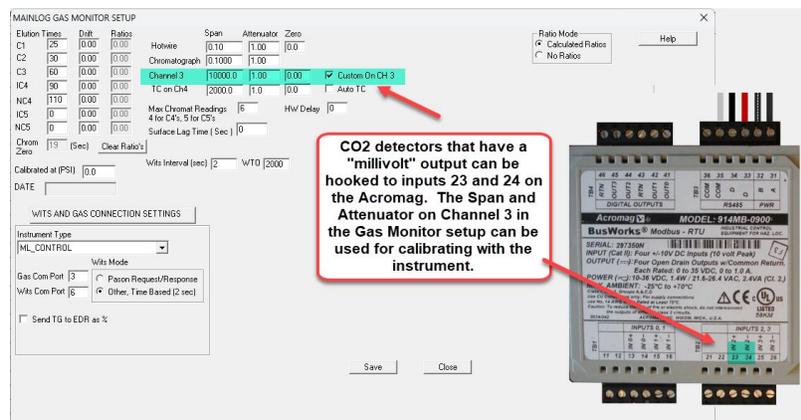


From the Custom Wits dialog, the **Connection Mode** should be **“Wits Gas”** or **“Paladin FID”**, also **check the box RigRooster**, choose the correct **Com Port**, **Time Out** should be **1500** and the **Read/Send Interval** at **2.0** seconds. **Save and Close** the dialog. From **Options** in **MainLog** check **Custom Wits** or **Paladin FID**.

If all is working correctly **MainLog will be sending Depth and Pump Strokes** to the RigRooster software and will be seen in their display.

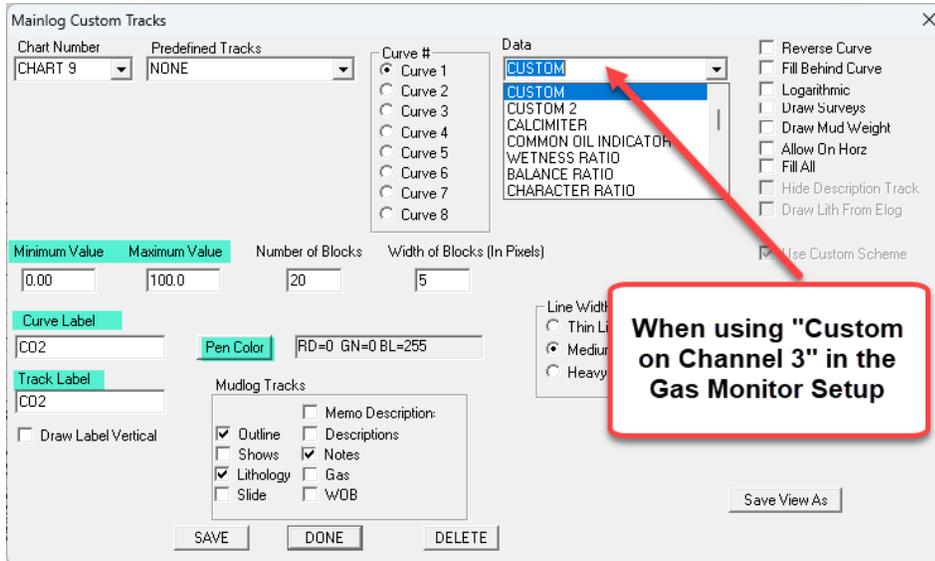
## Connecting a CO2 Detector to an Acromag with MainLog

There are a couple of requirements for MainLog to read a standalone CO2 detector. Foremost you must already be **reading Total Gas** from an **Acromag** and secondly the CO2 detector must have a millivolt output. The millivolt range of the instrument must be appropriate for the range that the Acromag is set to. So that MainLog can read and plot the data real-time, the leads should be connected to the Acromag on **Inputs 23 and 24**. Input 23 is positive, and 24 is negative.

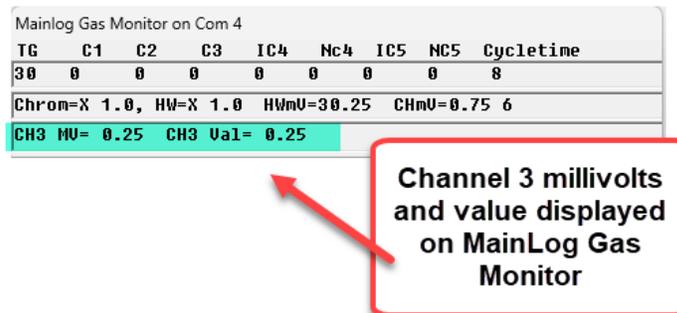


In the Gas Monitor Setup in MainLog use the **Span** and **Attenuator** on **Channel 3** to calibrate with the CO2 detector. Also check the box **“Custom on 3”**. MainLog

will use “**Custom**” in the “**Data**” selection of the Custom Tracks Dialog, to plot the readings. You will need to set up the track for CO2 in the Custom Tracks dialog. **Do not select CO2 in the Data selection box.** Use **Custom** and change the “**Curve**” and “**Track**” labels to **CO2** in the dialog. Set the scales, width and pen color.



The millivolts and CO2 values will be displayed real-time in the MainLog Gas Monitor.

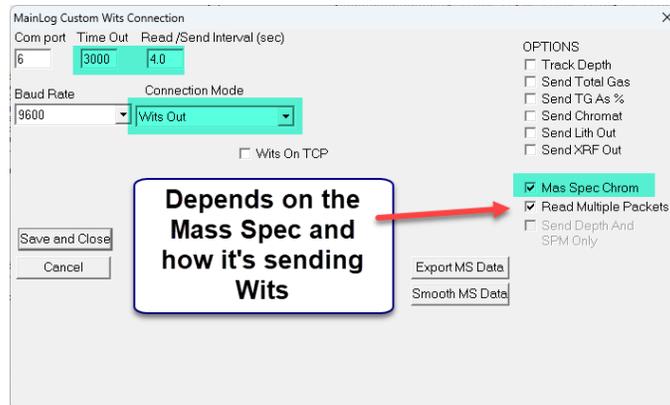


## Mass Spec

\*\*The following information is only available if the Mass Spec Instrument can send out data on WITS and use the WITS codes listed below.

- In the Gas Monitor Setup select the appropriate Instrument Type.
- Use MainLog WITS monitor for EDR provider...select appropriate setting (Pason Request /Response or Time-Based (2 sec))

- **Use Custom WITS for the Mass Spec.** In the Custom WITS dialog the Connection Mode is, **WITS OUT**. Check box **Mass Spec Chrom**. **Time Out** should be **3000** and the **Read/Sec Interval 4.0 seconds**. Settings on the Mass Spec side should be compatible. Note the Time Out and Read/Sec Interval can be changed if need.
- Depending on the Mass Spec and how it sends out WITS, it may be required to check the box **Read Multiple Packets**. (OneGeo Mass Spec) Call if needed.



- All Mass Spec data must be set up on Custom Tracks. Including TG, C1-C10 and/or other appropriate custom tracks that may be required for the Mass Spec data.
- Readings from regular gas instruments will be logged onto the usual gas track.
- The “**Export MS Data**” button will create a text file in the **c:\mainlog** folder named, “<filename>-MS.txt” and contain the listed Mass Spec data that was read or imported into MainLog.
- The “**Smooth MS Data**” button is used to fill in gaps in the data that are 10 feet or less and **will permanently change the original data**, so before using the “**Smooth MS Data**” feature we highly recommend backing up MainLog and/or doing a “**Save As**” and rename the log “<filename>-MS-Smooth” and then use this new filename to use the smooth feature on.

Gaps in the data are usually the result of high ROP rates where data is missed writing to the record. If MainLog reads a zero or null value (-999) in the text file for C1, it will fill in the gap by carrying the previous valid reading greater than zero up to a maximum of 10 feet for all the items in that interval.

- Below are the codes for the Mass Spec Data which can be modified by just changing the label on the curve in Custom Tracks.
- MainLog sends, lag depth, bit depth, and hole depth gas back to the Mass Spec.

## Mass Spec WITS Codes

Below are the set of Mass SpecWits codes we use. These codes vary from instrument to instrument, so please contact us as we most likely can accomadate variations from these codes.

The following are codes to use for the selected items, including 5 custom codes that you can use for any item. You can substitute different items, and identify them using the Curve label on the Custom Track.

```

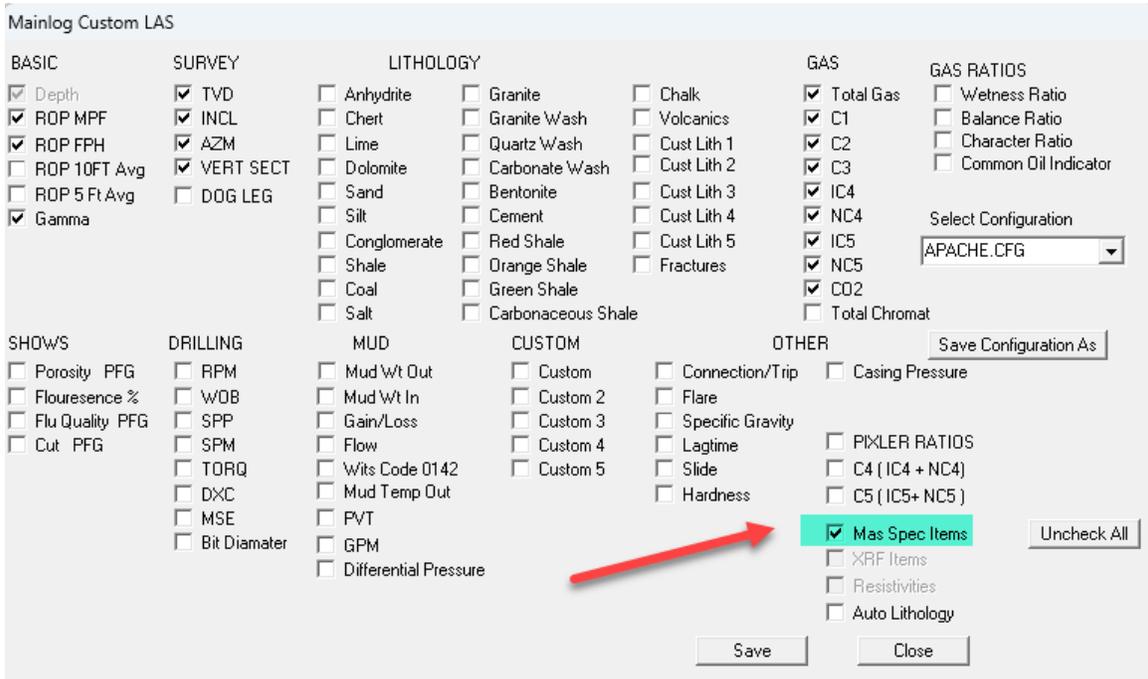
FIT_THC 0 //tot hydrocarbon
FITC1 1 //1212
FITC2 2 //1213
FITC3 3 //1214
FITC4 4 //1215
FITC5 5 //1217
FITC6 6 //1224
FITC7 7 //1225
FITC8 8 //1226
FITC9 9 //1227
FITC10 10 //1229
FITC02 11 //1222
FIT_N2 12 //5009
FIT_BENZENE 13 //5008
FIT_TOLUENE 14 //5007
FIT_C3OBM 15 //5000
FIT_C4OBM 16 //5001
FIT_C5OBM 17 //5002
FIT_C6OBM 18 //5003
FIT_C7OBM 19 //5004
FIT_C8OBM 20 //5005
FIT_C9OBM 21 //5006
FIT_S0 23 //5012
FIT_S02 24 //5013
FIT_CS2 25 //5014
FIT_HE 26 //5010
FIT_H 27 //5011
FIT_H2O 28 //5015
FIT_CO2PLUS 29 //5016
FIT_O 31 //5018
FIT_ARGON 32 //5019
FIT_TOT_AROM 33 //5020
FIT_NAPTHENES 34 //5021
FIT_CYCC4 35 //5022
FIT_CYCC5 36 //5023
FIT_CYCC6 37 //5024
FIT_CYCC7 38 //5025
FIT_CYCC8 39 //5026
FIT_CYCC9 40 //5027
FIT_CYCC10 41 //5028
FIT_XYLENE 42 //5029
FIT_AROMATICS 43 //
FIT_NC4 44 //5030
FIT_NC5 45 //5031
FIT_PARAFIN 46 //5032
FIT_R0 47 //5033
FIT_R1 48 //5034
FIT_R2 49 //5035
FIT_R3 50 //5036
FIT_BEN_DB_TOL 51 //5037
FIT_BEN_DB_NC6 52 //5038
FIT_CUST1 53 //5039
FIT_CUST2 55 //5040
FIT_CUST3 56 //5041
FIT_CUST4 56 //5042
FIT_CUST5 57 //5043

```

## Mass Spec LAS

If MainLog detects that a Mass Spec is being used, a **Custom LAS** file can be created to include Mass Spec items. Go to **Configure LAS** in **Setup...Lines and Scales** and check the box **Mass Spec Items**. Be sure to check the **Custom LAS** box in Lines and Scales, **Save and Close**.

MainLog will include any Mass Spec items, from the above list, coming in on Wits or imported that have values, in the Custom LAS file. If there is a Mass Spec item that is not in the list, let us know and we may be able to add it.

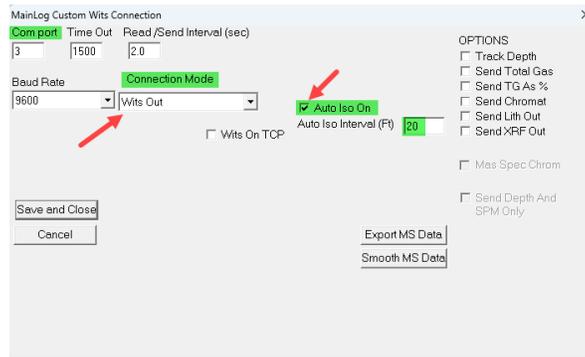


## Gas IsoTube by Stratum

Custom WITS is used when operating the **Stratum IsoTube Instrument**. Go to **Setup...Setup Custom WITS Feed**. Enter the proper **Com Port** and set the **Connection Mode** to **Wits Out**.

- Check the box **Auto Iso On**.
- Set the **Auto Iso Interval**, in Feet, for the interval to trigger a sample.
- Next enter the **Auto Iso Delay (Sec)** which is the number of seconds for MainLog to send the trigger WITS code (**66661**). Typically, 4 seconds should be sufficient.

MainLog will send out on the custom com port **Lag Depth, Time, Total Gas** and the **Trigger Code 66660** (no trigger) or **66661** (trigger a sample).



## Trouble Shooting

Should MainLog Crash and the file opens, but you are missing “Columns” or data, close MainLog and go to the c:\Mainlog folder and delete the “**filename.sch**” file. Re-open MainLog.

Should MainLog Crash and the file does not open go to the **c:\mainlog** folder and delete the “**filename.mlc**” file. This is the gamma ray. Re-open MainLog. Note, when deleting the “mlc” file you will have to re-import the gamma.

Should MainLog Crash and the file does not open go to the **c:\mainlog** folder and delete the “**filename.cfg**” file. Re-open MainLog. Note, when deleting the “cfg” file you will have to re-enter information in the Gas Monitor Setup.

### **If deleting the sch and cfg file does not work; call us.**

If the TVD log fails to open re-check your surveys. If you do not see any errors go to the **c:\mainlog** folder and look for the files that begin with the “**tilde**” symbol, ( ~ ). When creating a TVD log MainLog replace the first letter in the filename with a tilde, i.e. **Elogdemo.mlw** will be **~logdemo.mlw**. Delete all the files that begin with the tilde (~). Open MainLog and try creating the TVD again.

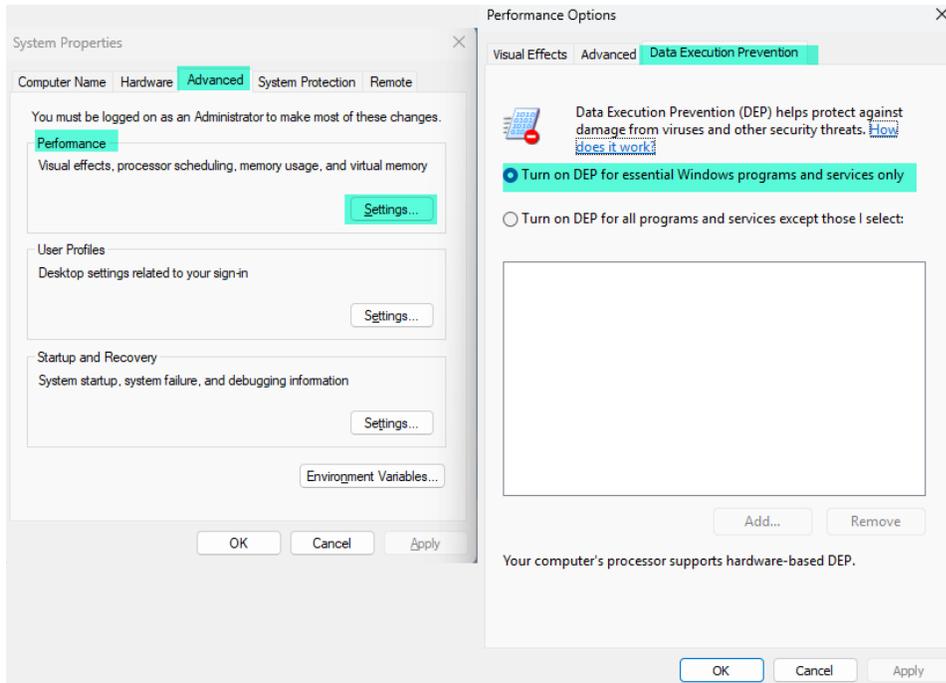
If MainLog crashes and you lost footage on the log, see [Restore](#)

If MainLog crashes and your WITS and Gas com ports fail to hook up. Go to the Gas Monitor Setup and reverse the com ports for WITS and Gas. It’s not uncommon that Windows may have swaped them.

## Exception Error after new Install

After a new install if opening MainLog causes an “Exception error”, the issue may be a [Data Execution Prevention \(DEP\)](#) setting.

In the computer search bar type, **View Advanced System Settings**. Click on the **Advanced** tab, then under **Performance** click on **Settings**. From here click on **Data Execution Prevention** and select **Turn on DEP for essential Windows programs and services only**. Click on **Apply** then **OK**. **You will need to re-start the computer for the changes to take place.**



If “**Turn on DEP for essential Windows programs and services only**” is already checked, then the issue is **not DEP**. Cancel out and contact us.

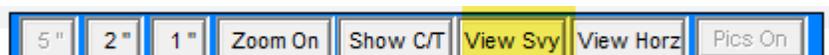
## **Pioneer Natural Resources Logs**

In MainLog when “**Pioneer Natural Resources**” is the company name in the MainLog “Header”, certain features in MainLog will be altered. Surveys will not appear on the log until a Kick Off Point, (**KOP**) is entered on the log as a “**Memo Description**” in a certain format. The surveys will only appear on the log from the KOP down. Also in **Setup\Lines and Scales**, “**Use Alternate Survey Position**” will be defaulted on and grayed out.

An example of the description memo to show the surveys should be in the following format:

### **KOP @ 8,932' MD**

The comma, foot mark or MD can be left off, but KOP, @ and the depth must be there with a space between them. Remember to click on, “**View Svy**” button on the quick view menu bar.



There are also some variations with the LAS file, differences in the “Conn” mark, and lithology colors when Pioneer Natural Resources is the company name in the header.

### **\*File Types Used by MainLog:**

- .cfg** contains setup information and closing info so display will be restored to the same state it was in when MainLog last closed, one for each data file
- .cht** contains time based log data, can be displayed in drilling mode in real time gas chart
- .dst** contains all DST information if any
- .fit** contains from FIT chromatograph
- .gas** contains actual readings from hotwire and chromatograph if **Gas Monitor** is enabled
- .grdx** configuration files for custom tracks, not available to all clients
- .hdr** contains header information, one for each data file
- .hor** configuration file for horizontal view, also contains horizontal notes if any
- .ini** contains file name of last open file and in some cases other information
- .lag** stores lag calculator file
- .lfg** configuration files for custom shale colors
- .las** contains mudlog, drilling and gamma data from the well
- .ml\_** file created for emailing. Compressed, contains all necessary auxiliary files
- .mlc** contains imported E-LOG data
- .mlw** 32 bit data file (Windows only)

<b>.mlx</b>	32 bit extended data file (Windows only)
<b>.qpt</b>	contains all the daily short reports, if any
<b>.rpt</b>	contains all the daily mud log reports, if any
<b>.sch</b>	contains settings for schemes if any
<b>.sho</b>	files containing all the show reports, if any
<b>.td_</b>	file created at TD when archiving or creating a new well file. Compressed, contains all necessary auxiliary files
<b>.top</b>	contains information about any <b><u>Tops</u></b> associated with this file
<b>.trg</b>	contains survey data for the horizontal target curve
<b>.wfg</b>	configuration files for WITS data charting
<b>.wit</b>	contains WITS data if logger has a WITS feed in the field
<b>.xrf</b>	contains the XRF data which is plotted on custom tracks

## **Metric Program**

With just a few differences, the “Metric” version of MainLog incorporates the same features and functionality of our “English” program. Because of this, most this manual is interchangeable for both versions. The primary difference is with entering/editing of **ROP, Gas, and Lithology**. The process is basically the same, except for the increment that is used.

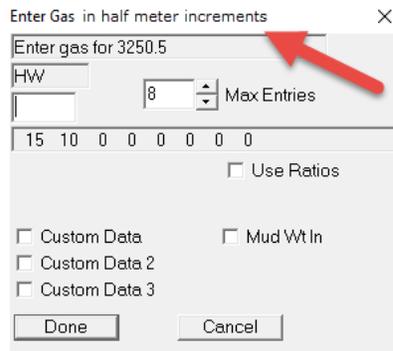
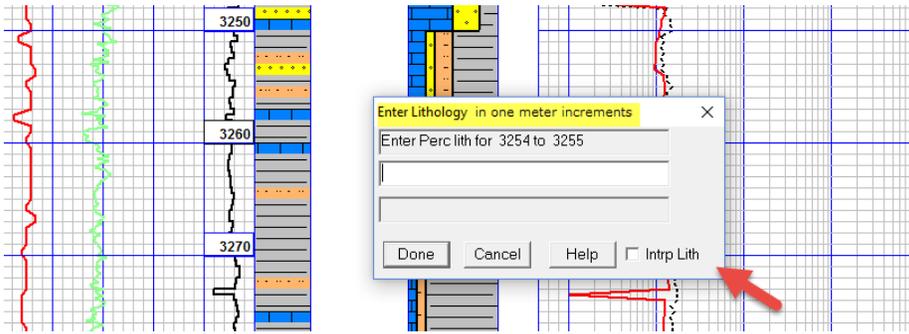
In the **English Version**, ROP is entered by “one-foot” increments, while Gas & Lithology are entered in the “two-foot” increments. The **LAS** data is also created in “one foot” increments.

In the **Metric Program**, ROP and Gas are entered in “half meter” increments, while lithology is entered in “one meter” increments. The **LAS** data is created in “half meter” increments.

In addition to the standard lithology column, the **Metric Program**, has an “**Interpretive Lithology**” column, where the user has the option to enter/edit separately from the standard lithology.

When entering Lithology, whatever rock is entered first, will automatically be put in the Interpretive column, regardless of the percent. The Lithology dialog also has an “Intrp Lith” box that can be checked to enter lithology directly to that column. “Ctrl + double click” in the Interpretive Lithology column will access the dialog as well.

The standard lithology column will be unaffected when entering/editing from the interpretive lithology column.



Currently, in the “**Metric Lag Calculator**”, only the depth and length are entered in meters. The casing, pipe and hole diameters are still entered in **inches**. Barrels and gallons are also used in the pump values. *Please contact us if metric values are preferred for all entries in the Lag Calculator.*

### Keyspan USB to Serial Adapter by Triplite

