11. Drillhole Database Manager



Drillhole Database Manager is a separate add-on module designed to work seamlessly within MAADgis. The module is not available until it has been purchased and added to the company's license file. This is authenticated at application startup.

The Drillhole Database Manager is a database driven application that is accessible through the MapInfo interface to store and access geological Drillhole and sample location information.

This section outlines the setup and usage of the Drillhole DBMS module.

11.1 Drillhole DBMS Environment

The database has been built around MS Access, with an interface in MapInfo Professional. Currently the database structure is defined, and outlined in the next section.

Future direction of this Drillhole DBMS is to provide direct access ODBC compatible databases (i.e. SQL Server, Oracle).

This application can reside under a single directory, and the following files are required,

MAADdbms.MBX Application to execute in MapInfo

MAADbCfg.txt Configuration file

MAADdhole.mdb

MS Access database to store project parameter settings, and Drillhole information if required.

MAADdhole_blank.mdb

Blank database used as a template to store Drillhole data.

11.2 Database Relationships

To define a relationship between objects, the common join is the HoleID and ProjID. HoleID is the identifier of the hole, and ProjID is the project identifier.

There should never be 2 HoleID's and ProjID's the same within the same project.

5 Core database tables exist, and contain all the required information about the project, collars, survey, assay and downhole geology data.

Look up tables exist that relate directly to the core tables to provide consistency in item and values.



It is not advisable to change any structures, relationships, table or column names or types as incorrect operation of MAADdhole cannot be guaranteed.

11.2.1 Project – Collar Table Relationships



In defining a project, the project number is automatically assigned into the id field (autonumber), therefore there can only be **1** project identifier. This project identifier is used throughout the database structure to identify what project an item belongs to.

2 look up tables exist, one for the hole status, the other for the hole type. If an item is not within these 2 tables, it is automatically added at runtime through the interface.

During the program run time, a number of fields are joined to provide exporting or uploading functionality. On exporting, MapInfo uses the columns of Easting and Northing from the tbl_Collars table, and creates them spatially using the projection defined at the project's creation (tbl_projects.projection).

m m id HoleID m HoleID ProjID HoleID m rom ProjID Easting m То EditDateTime Northing Value Username m RL Unit TheItemsChanged Azimuth Element ThePreviousItems m Dip Sample Reason TotDepth Batch HoleType LabBatch HoleStatus m LabName Company Unit m LabMethod LoggedBy LabDates LoggedDate Priority lut_NumElements Prospect ProjID Element abMethod m LabName Element Unit LowerLimit UpperLimit Priority LabMethodDesc

11.2.2 Collar – Assay Table Relationships

Any numerical values (i.e. assays) are uploaded or added to the tbl_Values_Num table.

The primary unique identifiers are the **HoleID** and the **ProjID** fields, however the following fields are used as the secondary unique fields to define a single item,

From To Unit Element

Priority

Test are undertaken at various stages of the programs operation to ensure the combination of these entries ensure a unique value within the database at all times.

3 look up tables interact with tbl_Values_Num table,

- Lut_NumUnits (i.e. ppm, ppb,%, etc)
- Lut_NumElements (i.e. Au, As, Pb, etc)
- Lut_LabMethod (i.e. XRF, FA_ICP, etc)

When altering values in these look up tables, the values entered in the primary join fields must be of continuous characters only (no illegal characters).

Values used in these fields are automatically assigned as column names within MapInfo, and program errors will occur if illegal MapInfo column characters are identified.

A similar relationship structure is used for textual items (tbl_Values_txt), except the units look up table is omitted. The lab method options can be substituted for sampling method, geophysical observed or measured methods, etc. for textual data added within tbl_Values_txt.tbl

11.2.3 Collar – Survey table Relationships

The Survey table is fairly much stand alone, and does not have any look up tables that interact with it.

The common link fields are the HoleID and ProjID fields, with the field of 'To' providing the unique field for validation.

11.3 Core Database Structure

11.3.1 Project Table

[tbl_projects]

id	unique identifier. Autonumber field. Main link
field.	
Name	Name of the project
Region	Region or additional info field
Country	Country of the project
Company	Company that owns the project, or who collected
	the info
min_x	Minimum X Coordinate of the project
min_y	Minimum Y Coordinate of the project
max_x	Maximum X Coordinate of the project
max_y	Maximum X Coordinate of the project
projection	Projection of the drillholes. Must be MapInfo
	projection syntax.
ProjLinked	If the project is linked to others
DSNType	Type of Database. $1 = MS$ Access, $2 = ODBC$
	DSN
DSNConnection	Connection string to database.
ProjID	Holds the id defined for the project if disconnected
-	from the main database.

	tbl_Projects : Table		
	Field Name	Data Type	
₽₽	id	AutoNumber	Main link or identifier of project
	Name	Text	Name of the project area - selection interface option
	Region	Text	Sub region of the country
	Country	Text	Country - selection interface option
	Company	Text	Company - selection interface option
	min_x	Number	Min Longitude
	max_x	Number	Max Longitude
	min_y	Number	Min Latitude
	max_y	Number	Max latitude
	ProjectionName	Text	Name of the projection
	Projection	Text	Will be in MapInfo format - initially used to
	ProjLinked	Number	if the area is a sub area of another, the number will be linked here
	DSNType	Number	Type of connection 1= Access .mdb, 2 = DSN
	DSNConnection	Text	Connection string
	ProjID	Number	duplicate of id
	ProjLinked DSNType DSNConnection ProjID	Number Text Number	Type of connection 1= Access .mdb, 2 = DSN Connection string duplicate of id

11.3.2 Collar Table

tbl_Collars : Table		
Field Name	Data Type	
HoleID	Text	Primary key - identifier of the hole - must be unique
Easting	Number	X coordinate - must all be inteh same projection
Northing	Number	Y coordinate - must all be in teh same projection
RL	Number	Height
Azimuth	Number	azimuth 0 - 360
Dip	Number	dip 0 - 90
TotDepth	Number	depth of the hole
HoleType	Text	what sort of hole it is - DD, RAB, RC, etc
HoleStatus	Text	status of the hole - complete, in progress, proposed, etc
Company	Text	Name of Company who (not driller), but company who commissioned the drilling
LoggedBy	Text	name of person who logged/drilled/sampled
LoggedDate	Text	the date - dd/mm/yyyy
Prospect	Text	can be prospect name, tenement number, etc
ProjID	Number	Primary key - linked to project table
id	AutoNumber	used internally for record identification

[tbl_collars]

HoleID	The hole identifier.	
	Main link field and must be unique	
Easting	X coordinate, must be in projection describe in	
	tbl_projects	
Northing	Y coordinate, must be in projection describe in	
-	tbl_projects	
RL	RL elevation of the hole	
Azimuth	Direction the hole was drilled. Orientation from	
	true north.	
Dip	Angle the hole was drilled. Downhole dip should	
-	be negative.	
TotDepth	Depth of the hole (in metres)	
HoleType	The type of hole (RAB, RC, DD, etc)	
HoleStatus	Status of the hole (i.e. drilled, proposed, etc)	
Company	The company who commissioned the hole	
LoggedBy	Who drilled the hole	
LoggedDate	Date the hole was drilled	
Prospect	Name of the prospect	
ProjID	Project link. Main link field.	
Id	Unique record identifier, autonumber field.	

Drillhole surface trace uses the columns of Azimuth, Dip and TotDepth from the collar table.

Updating the values of Azimuth, Dip and TotDepth can be generated automatically through the interface for a particular collar from the associated tables of Assay, Geology or Survey.

11.3.3 Assay Table

æ	tbl_Values_Num : Table		
	Field Name	Data Type	
►	HoleID	Text	Primary Key - has to be unique for collars
	ProjID	Number	Number to link to the Project Name, used with HoleID to select.
	From	Number	Primary key - start m
	То	Number	end m
	Value	Number	The value of the column - 123.23, -37.23 etc
	Unit	Text	Unit of the value if applicable - ppb, ppm,etc
	Element	Text	Will be the associated column title - Au, Rock, etc
	Sample	Text	Sample ID
	Batch	Text	Company batch ID
	LabBatch	Text	Lab Batch ID
	LabName	Text	Name of Lab - No spaces Will be the associated column title
	LabMethod	Text	Method lab used
	LabDates	Text	Dates in and out of the lab
	Priority	Text	should be a number ranking - 1,2,3 etc
Ŷ	id	AutoNumber	internal id - automatically generated

[tbl_Values_Num] HoleID

HoleID	The hole identifier. Main link field and will be	
	duplicated.	
From	The starting downhole interval value	
То	The ending downhole interval value	
Value	The value (must be a number)	
Unit	The value unit of measurement (i.e. ppm, ppb, et	
Element	The element type (ie Au, As, Pb, Zn, etc)	
ProjID	Project link. Main link field.	
Id	Unique record identifier, autonumber field.	
Sample	The sample number (Yours)	
Batch	The batch number (Yours)	
LabBatch	Lab batch number	
LabName	Name of the laboratory	
LabMethod	Method used for analysis	
LabDates	Dates in / out of the lab	
Priority	Quality of values 1 (H), 2, 3, etc	

This table stores all numerical assay values in a normalised structure for a Drillhole interval. When data is exported to MapInfo, a flat file

structure is created, where the values column name comes from combining the Element value and the Unit value for a record. These 2 values are separated by an underdash (i.e. Au_ppm).

11.3.4 Downhole Geology Table

	tbl_Values_Txt : Table	9	
	Field Name	Data Type	
►	HoleID	Text	
	From	Number	
	То	Number	
	Value	Text	The value of the column Pk, Cs, etc
	Element	Text	Will be the associated column title Lithology, Rock, etc [no spaces allowed]
	ProjID	Number	Number to link to the Project Name, used with HoleID to select.
8	id	AutoNumber	
	Sample	Text	Sample ID
	Batch	Text	
	LabBatch	Text	
	LabName	Text	
	LabMethod	Text	
	LabDates	Text	
	Priority	Text	

	[tbl_Values_Txt]	
	HoleID	The hole identifier. Main link field and will
	be duplicated.	
	From	The starting downhole interval value
	То	The ending downhole interval value
	Value	The value (must be text)
tc)	Element	The element type (i.e. Lithology, Rock, etc)
ic)	ProjID	Project link. Main link field.
	Id	Unique record identifier, autonumber field.
	Sample	The sample number (Yours)
	Batch	The batch number (Yours)
	LabBatch	Lab batch number
	LabName	Name of the laboratory
	LabMethod	Method used for analysis
	LabDates	Dates in / out of the lab
	Priority	Quality of values 1 (H), 2, 3, etc

This table stores all text values and comments in a normalised structure for a Drillhole interval. When data is exported to MapInfo, a flat file structure is created, where the values column name comes from the Element value of a record.

11.3.5 Survey Table

tbl_Survey : Table				
	Field Name	Data Type		
	HoleID	Text	hole identifier	
	То	Number	distance down hole 15, 35, etc	
	Azimuth	Number	< 360 degrees	
	Dip	Number	<= 90 degrees	
	ProjID	Number		
P	id	AutoNumber		

[tbl_Survey]

HoleID be duplicated.	The hole identifier. Main link field and will
To cumulative.	The ending downhole interval value. Is to
Azimuth	Direction the interval was drilled. Orientation from
Din	Angle the interval was drilled. Downhole din
Dip	should be negative
ProjID	Project link. Main link field.
Id	Unique record identifier, autonumber field.

11.4 Database Look-Up Tables

A number of look up tables exist within the database that are joined automatically at runtime within the MAADdhole interface.

No administration interface is available within the MAADdhole interface, and additions or alterations to these look up tables must be completed by accessing the database tables themselves.

These look up tables are to be set with company standards before drilling data is added. Changes to the MAADdhole_blank.mdb will ensure all future created project databases will contain the required standards.

The following look up tables are defined;

- Hole Status
- Hole Type
- Lab Method with detection limits for elements
- Elements
- Units of measure

Important: When altering values in these look up tables, the values entered in the primary join fields must be of continuous characters only (no illegal characters).

Values used in these fields are automatically assigned as column names within MapInfo, and program errors will occur if illegal MapInfo column characters are identified.

Illegal characters to MapInfo column definitions include $\,/,l,-,\#,@$, spaces, etc), and column names can include numbers as long as they are not the first character. You can use an _ as a space separator if required.

11.5 Preparing data for import into the Drillhole DBMS.

To prepare mass data for easy importation to the Drillhole DBMS structure, organise your data into 4 Mapinfo tables, a collar, assay, downhole geology and survey tables. Separate data into these individual files based on unique project areas.

Ensure assay and downhole geology tables are normalised (i.e. 1 value after another as apposed to a flat file structure).

Project ID values will be assigned at time of project creation, and must be appended to the column of ProjID before uploading to the appropriate database. **Do not create a column called ProjID in any of the tables to be uploaded, as this will affect the Bulk Upload functionality.**

The following table structures with appropriate data should be defined in MapInfo for easy importation;

11.5.1 Collar Table

[??_collars.tab]

HoleID	Character (30)
Easting	Float
Northing	Float
RL	Float
Azimuth	Float
Dip	Float
TotDepth	Float
HoleType	Character (12)
HoleStatus	Character (12)
Company	Character (30)
LoggedBy	Character (30)
LoggedDate	Character (30)

Prospect ProjID * Character (40) Integer

Minimum fields required to upload a file,

HoleID	Character (30)
Easting	Float
Northing	Float

11.5.2 Assay Table

[??_Assays.tab]

HoleID	Character (30)
From	Float
То	Float
Value	Float
Unit	Character (12)
Element	Character (12)
ProjID*	Integer
Id*	Integer – leave as 0
Sample	Character (30)
Batch	Character (30)
LabBatch	Character (30)
LabName	Character (30)
LabMethod	Character (30)
LabDates	Character (50)
Priority	Integer

Minimum fields required to upload a file,

Character (30)
Float
Float
Float
Character (12) – you assign on testing/upload
Character (12) – you assign on testing/upload

Priority

Integer

This version of MAADdhole requires assay data to be a flat file format to be uploaded, where repetition of uploading values of similar elements and units are required.

Structuring files this way and uploading them in this manner is required for proper validation of the data, such as duplicates records.

When you receive data from external sources, data quality and completeness of the data can come in many formats. At worst case scenario, the following is usually supplied,

82	🚇 Assay Browser					
	HoleID	From	То	Au_ppm		
	BERB001	0	3	0.037		
	BERB001	3	6	0.391		
	BERB001	6	9	0.014		
	BERB001	9	12	0.01		
	BERB001	12	15	0.025		
	BERB001	15	18	0.012		
	BERB001	18	21	0.008		
	BERB001	21	24	0.008		
	BERB002	0	3	0.053		
	BERB002	3	6	0.018		
	BERB002	6	9	0.014		
	BERB002	9	12	0.01		
	BERB002	12	15	0.0935		

To help with validation, and to ensure you give some priority value to the quality of the data, create a new column called 'priority', of type integer. At a minimum, use the following scale of values for data quality or ranking

0 – unknown, 1 – Highest >> 5 Lowest.

In future versions the process of uploading normalised files will be included.

11.5.3 Downhole Geology Table

[??_Lithology.tab]

HoleID	Character (30)
From	Float
То	Float

Character (50)Value Element Character (12) ProiID* Integer Id^* Integer – leave as 0 Sample Character (30) Batch Character (30) LabBatch Character (30)LabName Character (30) LabMethod Character (30) Character (50) LabDates Priority Integer

For downhole geology tables, Labmethods, Labnames, etc can be substituted for sampling method, or person who undertook the sampling.

Minimum fields required to upload a file,

HoleID	Character (30)
From	Float
То	Float
Value	Float
Element	Character (12) – you assign on testing/upload
Priority	Integer

11.5.4 Survey Table

[??_Survey.tab]

HoleID	Character (30)
То	Float
Azimuth	Float – from 0 to 360 degrees
Dip	Float and value should be negative. Values from 0
to -90 degrees	
ProjID*	Integer

* A unique identifier value (id) is assigned to each of the above tables, which is not to be specified in MapInfo.

11.6 Creating Drillhole Projects

To get started, first a project must be defined.

It is within this project creation phase that the project name, spatial projection and unique project identifier is defined.

If no projects are defined, the project definition interface is automatically displayed, otherwise a project can be defined from within the Drillhole Project Manager or the Drillhole Manager interface by selecting the 'Create New Project' button.



Important fields to complete are;

- Project Name
- Country of project
- Project Owner
- Projection (all locations must be of type selected no multiple projections allowed)
- Data storage (choose database method to store)

A project ID cannot be changed once it is created (generated automatically using an autonumber field)

11.7 Tests Required For Uploading Data to the Database

To bulk upload data, a number of tests must be performed on the data to be uploaded to ensure data quality within the database is maintained.

Primarily, the tests perform the function of duplicate checking, both within the file to upload, and within the database.

Files will not be able to be uploaded unless the tests are successfully performed, and performed within the same 24 hour testing period.

Additional tests can be performed on the files, however they have no bearing on the upload process.

You must systematically work through every test that is required for each data item (collars, assays, etc), and re-running the required tests must be made after alterations are performed.

Alterations must be performed on a file of the same name, and within the same 24 hour period to then successfully use the Data Loader or Bulk Upload function.

11.8 Using the Drillhole Database Manager

11.8.1 Viewing Data from the Drillhole DBMS

Select from the option of **Drillhole Database Manager >> Display YOUR Drillhole Database ...**

MAADgis		
OPEN and ACCESS your data	•	🛛 🕄 🌱 🛋 🖌 🖌
SPATIALLY Search for GIS Data KEYWORD Search for GIS Data		
Dynamic Map Creation Dynamic Legend Generator Dynamic Map Grid Generator	•	
Drillhole Database Manager	►	DISPLAY YOUR Drillhole Database
MAADgis Analysis tools MAADgis CAD tools MAADgis Utility tools)))	View additional drillhole databases
MAADgis Administration Help and About	۲	
Exit]

The option of 'View additional Drillhole databases' looks for additional MAADdhole programs that may be stored within sub-directories beneath the main program directory.

Select from the **country**, then **company** and finally the **drilling / sampling program or project** you wish to view

I. Select Country	2. Company	3. Drilling Project Name
Burkina Faso Cote D'Ivoire Eritrea Guanea Mali Rep of Congo (Dem) Tanzania Zambia	Adamus Anglo Ashanti Anmercosa Gilencar Gold Fields Golden Star Gyata / Jelgom JV <u>Systa Exploration</u> Leo Shield Normandy Resolute Sylop	Akrodie Soils BB Gridded Soils Bornaa Drilling Bornaa Soils Kukuom Soils Mampehia Soils Saponso Drilling Saponso Drilling Saponso Soils Tanoso Drilling Tanoso Soils Tonkoase Soils
Create New Project	1	Cancel DK

The database is searched by the project selected and collar information (Hole id, Easting, Northing and Hole type) is returned. If the number of collars is large, only Hole id is returned. If databases are large in size, it may take a while to display information. As a result, progress can be tracked in the message window.



The interface returned allows the user to either swap projects, double click on a Drillhole to edit it and/or display it's assay / downhole geology / survey information. Other options are available to **add a new project**,

add or delete a Drillhole, export the database to MapInfo or csv format, or upload new data to the database using the Data Loader or Upload Test functions.

Gyata Exploration Ltd : Drillhole Mar	nager 🔀
Create New Project Selected Project : id - 58 MAMPEHIA DRILLING	ation] - Ghana 📃 💌 2.6m
MDD001 DD [Drilled] MDD002 DD [Drilled] MDD003 DD [Drilled] MDD004 DD [Drilled] MDD005 DD [Drilled] MDD006 DD [Drilled] MDD007 DD [Drilled] MDD008 DD [Drilled] MDD009 DD [Drilled] MDD010 DD [Drilled] MDD011 DD [Drilled] MDD012 DD [Drilled] MDD015 DD [Drilled] MDD016 DD [Drilled] MDD017 DD [Drilled] MDD018 DD [Drilled] MDD019 DD [Drilled] MDD019 DD [Drilled] MDD020 DD [Drilled] MDD021 DD [Drilled] MDD023 DD [Drilled] MDD023 DD [Drilled]	Advanced Display Options Company Name ALL Hole / Sample Type ALL Status ALL Date from 1 ALL Date to 1 20/01/2006
Add Delete Export Uplo	pad Test Data Loader Close

Double-clicking a Drillhole will return all information associated with the Drillhole. To display the Drillhole information with associated assay information, select the appropriate checkbox. Reduced performance to display assay, geology and survey data simultaneously is noticeable when either 2 or 3 options are selected.

Drill Hole: GKD006			×
ASSAYS Found 886	GEOLOGY Found 955	SURVEY Found 13	Hole ID GKD 006
From - To Value 0.41.00 As ppb 0.41.00 Au ppm 41.0.42.020 As ppb 41.0.42.020 As ppb 42.0.43.020 As ppb 42.0.43.020 As ppb 42.0.43.020 As ppb 43.0.44.0215 Au ppm 43.0.44.0215 Au ppm 44.0.45.020 As ppb 44.0.45.0019 Au ppm 45.0.46.0019 Au ppm 50.051.0300 As ppb 50.051.0007 Au ppm 51.052.0415 As ppb 52.053.0007 Au ppm	From · To Value 0-1.0 Geol 1.0:2.0 Oal Geol 2.0:3.0 Vph Lith 2.0:3.0 Vph Lith 2.0:3.0 Vph Lith 3.0:4.0 Vph Lith 3.0:4.0 Vph Lith 4.0:5.0 Vph Lith 5.0:6.0 Vph Lith 5.0:6.0 Vph Lith 6.0:7.0 Vph Lith 6.0:7.0 Vph Lith 6.0:7.0 Vph Lith 8.0:30 Vph Lith 8.0:30 Vph Lith 8.0:30 Vph Lith 8.0:30 Vph Lith 10.0:11.0 Vph Lith 10.0:11.0 Vph Eeol 10.0:11.0 Vph Eeol 10.0:12.0 Vph Lith 10.0:12.0 Vph Lith 11.0:12.0 Vph Eeol 13.0:14.0 Vph Lith	To Azimuth, Dip 6.025, .55 30.028, .56 4.230, .56 54.030, .56 54.030, .56 56 95.032, .56 1280.0.33, .57 1800.0.34, .57 1800.34, .57 211034, .56 2400, .34, .55 2271.036, .54 301.036, .54	Easting: 57292205 Northing: 9 3842,351.0 RL / Elevation: 1 363.65 Azimuth: 2 4 Dip: 5 5 Total Depth of Hole: 3 00.6 Hole Type : PC/DDH Logged By : Date Logged :
Delete Add	Delete Add	Delete Add	Update Close

Further selecting of an assay, downhole geology or survey value will display a dialogue box that allows the item to be edited.

11.8.2 Updating Data

3 methods can be used to alter data in the database,

- Select an entry from the interface and manual alter the entry (alterations are tracked in the database automatically i.e. the changed record, what the record was previously, who changed it, and date)
- Use a routine inbuilt to an entry
- Alter the data in MapInfo, run it through the required testing procedures and use the bulk uploader functionality (great for large amounts of data).

11.8.2.1 Manual Selection

All items in the database can be changed, either by double-clicking an entry in a display window, or selecting from a dropdown menu.

All changes (when the update buttons are selected) are logged in the database, and these can be analysed at a later date for quality checking and reporting.

If a single change is required, this is the preferred method to use to change.



On selecting update, not only is the change written to the database, but also a few checks are undertaken to ensure data quality and uniqueness.

11.8.2.2 In-built Routines

Once new data is uploaded, cross table checks can be undertaken to ensure completeness of that data.

An example may be that when a drillhole was planned, its estimated depth was to be 50m, at a dip of 60 and azimuth of 235. In reality, when the drillhole was drilled, results back from and stored assay and survey files was indicate something different.

This data can be analysed per hole, and if required can be updated in the collar file to reflect the true value.

Options to undertake these functions are initiated with an associated button next to the measurement options of either Azimuth, Dip of Total depth.

Azimuth:	Dip:	
126 🕻	S -63	\mathbf{Y}
Total Dept	h of Hole:	
43		Ŧ
Status of H	lole:	

11.8.2.3 Bulk Uploads

To use the bulk upload function, ensure that the upload tests have been performed on the files to upload, and are successful in outcome.

It is best to structure or organise the data to upload (can only be done in MapInfo, therefore files that are supplied must first be imported into MapInfo), see the section on 'Preparing data to upload'.

11.8.3 Creating a Subset of Project Data

Data can be subsetted using the criteria of 'company name', 'the sampling type' and/or the 'status of the sample location'. This enables drilling data of different types, by different companies that are part of the same project area, a facility to centrally store the data and at the same time can be easily separated and exported.



11.8.4 Exporting Data to MapInfo

To export the data to display in MapInfo, select the **Export button**.

Data that is currently displayed in the '?? Collars found' window will only be exported.

Choose a directory to export the data to. The first **6** letters of the project are displayed in the filename prompt (this can be changed to a more meaningful name or left as is).

ICGI I NGITTO	, to buye n	II DI III IOIC II IIO	to m		-	
Save in:	🔄 drillholes		-	\$ E		
1						
ables Directory						
2						
Remote Tables Directory						
1						
Import Files Directory						
2						
Workspaces Directory						
	-					
	File <u>n</u> ame:	Gokona			-	Save
	Save as type:	Table (*.tab)			•	Canc
MapInfo Place	s					

Select the **type of data to export**. (Only collar data is initially checked, tick additional checkboxes as required).



Large databases to export may take time. Progress is displayed in the message window.

Message	×
GATHERING DATA	<u>~</u>
Searching for Assay data be patient	
25% completed	
75% completed	
100% completed	
Searching for Geology data be patient	
25% completed	
50% completed	
75% completed	
100% completed	
Searching for Survey data be patient	
25% completed	
50% completed	
75% completed	
100% completed	
Exporting Collar data be patient	
Exporting Collar Trace data be patient	
Completed Exporting Assay data	
completed Exporting Assay data	
	-
4	Þ

Collar data is created and displayed spatially within a map window at the **projection specified for the project**.

If the Drillhole surface trace option is **selected**, **azimuth**, **dip and total depth of the hole** is used to calculate this layer. The trace line is

projected onto the surface. This layer is automatically displayed within the same window as the collar table. The line style of the trace layer is symbolised as an arrow showing the direction of the hole.



These layers can be easily labelled, using the column of **HoleID** for collars, and **TotDepth** for the trace layer.



Additional Drillhole data can be extracted to MapInfo by reselecting the Export button. Be careful using this option when selecting filenames that may contain duplicates.



Assay and geology files are created into a flat file format, where a values unit type (i.e. ppm) and element are automatically created as column titles for easy identification. This function allows for many unique elements and values to be maintained within the database.

	🗏 Gokona_Assay Browser							
	HoleID	From	То	Sample	Au_ppm	As_ppb _	•	
	GKD001	0	1	N/S	0	0 -		
	GKD001	1	2	536715	0.04	-20		
	GKD001	2	3	536716	0.03	-20		
	GKD001	3	4	536717	0.03	-20		
	GKD001	4	5	536718	0.03	-20		
	GKD001	5	5.5	536719	0.03	-20		
	GKD001	5.5	6	537359	0.03	-20		
	GKD001	6	6.5	537360	0.02	-20		
	GKD001	6.5	7	537361	0.02	-20 ,	-	
4						▶	-	

Once the collar, assay, downhole geology and survey files are created, it is easy to integrate these files into Discover's Drillhole Cross Section generator.

11.8.5 Catalogue Drillhole Data using MAADgis

MAADgis can be used to catalogue exported Drillhole data, (the collar, projected assay/geology and survey trace data).

The process would be to export data to a directory, and then use MAADgis to catalogue.

When the database is updated, simply export the data again and overwrite the existing files (MAADgis is still pointing to the original filename selected).

If the extents of the drilling has changed, use the following MAADgis administration function,

MAAD Admin 🛛 🕅	Catalogue Reporting Tools
	Choose a catalogue reporting routine QUICK report generation Automatically UPDATE catalogue extents DELETE broken links from a catalogue
	Cancel OK

11.8.6 Create Drillhole Cross Section using Discover

To create a cross section, first make the Cosmetic Layer editable (Map >> Layer Control).

Layer Control		×
Layer: <mark>Cosmetic Layer</mark> Gokona_Trace Gokona_Collars		OK Cancel Display
Layers Add <u>R</u> emove	Reorder	HotLink

On the map window, draw a line that represents the length of the cross section to generate. Then select the line using the graphical select tool.

e ci	/D004	_	GKRC	:055		
● G	• GKRC	GKRC107 :138		GKRC115		
		GKRC141	GKRC056			
GKRC0	26	GKRC10& GKRC	:146	GKRC116	GKRC093	
GKRC105	GKRC13	GKRC142	e GKRC05Z			
GKRC027	• GI	(RC109	GKR6149	GKRC117		
GKDOOA	• GKR	C143 GKRC147	CVDCOZO		W GRRC032	
•	GKRC1	10		GKRC153 GKRC153		
	GKRC144			GKRC118	GKRC063	
	CKDC444	GRICE IN GRIC	.059 • G	NRC194		
	GNRC111	• G ÅD01	GKRC152 GKR	C119 •	GKRC064	
• G	KRC145	• GKRC060	GKRC ⁴	155		
• GKR	C112	GKRC114	GKRC120	● GKRG	C065	GKRC1
		GKRC061	•	GKRC12	2	
	10		GKRC121	GKRC066		
GKD0 ⁻	• (GKRC062				
● GKD0 [.]			GKD012	GKRC067	• GKRC158 • GKF	C069
● GKD0			- 010012			

If **Discover's >> Drillhole Display** menu is not active, then select it from the Discover dropdown menu. From the Drillhole menu, select **Setup**.

Drillholes
Setup
Section Manager

Select the **New** option (if a Drillhole project hasn't been selected before), and define the **Drillhole project name and the same directory** that the collar, assay, etc files have been created in.

Next, an interface is displayed to define the **collar, assay, downhole geology and surface file parameters** (if they apply).

Drillhole Collar Table (mandatory)) G	okona_Collars	•
Downhole Survey Table (optiona	al) G	okona_Survey	•
-Downhole Data Tables	Selected		ОК
Gokona_Assay Gokona_Survey Gokona_Geology	Gokona_A: Gokona_G	ssay eology	Cancel Help
Open Table Open ODE	3C		
- Gridded Surface Tables			
Topography	Select a Table		
Polygon Surface	Select a Table	• 🔽	
Other Surfaces	Chosen		
Select a Table			

Assign column values for tables. The files exported from Drillhole DBMS will contain the correct fields that align with HoleID, Azimuth, from, to etc

Ensure down dip is negative is selected.

Assign Spatial Columns

[-Collar Table Col	umns	1	DownHole S	urvey Columns
	Hole ID	HolelD 🗾		Hole ID	HoleID 🔹
	Collar Easting	Easting 🔹		Depth	To
	Collar Northing	Northing 📃 💌		Azimuth	Azimuth 📃
	Collar Elevation	RL 💌		Dip	Dip 💌
	Collar Azimuth	Azimuth 📃 💌		Denvellele D	ata Calumus
	Collar Dip	Dip 💌			Jata Lolumns
	Total Depth	TotDepth 📃		Hole ID	HolelD 🗾
l				Depth From	From 💌
[-Surface Column	18	1	Depth To	To 💌
	Topo Elevation	7			is negative OK
	Polygon Code	v		Depth Units	m Cancel

Once the Drillhole display project parameters are set, close this window. Once a project is set, the above option only has to be completed once (unless the directory that contains the resulting collar, assay, geology files has been deleted.)

[Drillhole Display - Choose Project	×					
	Select Drillhole Project or Directory Gokona	OK					
	New Modify Delete	Cancel					
	Use Open Section Select section to use from a list of open sections						

To display a cross section, from the Drillholes menu, select the option to **Select New Section.**

X



From the next interface that is display, select

- The checkbox for Use selected line
- Add section name (or leave if OK)
- Define the envelop width

Drillhole Plotting - Gokona 🛛 🛛 🗙					
Drillhole Display	Section Definition				
Vertical Section	Section Start m E 673028				
C Horizontal Plan	Section Start m N 9842582				
	Section Top (m)				
Hole Selection by	Section Orientation 32				
Manually select	Section Length (m) 93				
Specify section	Envelope Width (± m) 50				
✓ Use selected line	View Direction Deg.				
Search all holes	N9842581				
	,				
Display Options					
Downhole Data Select do	wnhole tables to use for this section				
Surfaces Select su	rfaces to display for this section				
Annotation Specify la	abelling, scaling and data display				
Multiple Sections Specify parameters for multiple sections					
Plot Now OK Cancel Help					

Before the **Plot Now** button is selected, select the **Downhole Data** button to define assays and/or geology to display.

Downhole Data Selection		×
Available Downhole Data Tables Gokona_Assay Gokona_Geology Add Remove	Selected data to display Gokona_Assay Gokona_Geology	OK Cancel

Selecting OK, will dismiss the interface and the drillholes that fall within the envelope distance (defined on the Drilling Plotting dialogue box) will be selected.

🔤 Gokona_Trace, Gokona_Collars Map			<u>- 🗆 ×</u>
• GKRC018 • GKRC041 • GKRC036			
GKRC019 GKRC042 GKRC037			
● GKRC020 ● GKRC043 ● GKRC038			
GKRC021 GKRC040 GKRC100 GKRC039			
GKRC096 GKRC049 GKRC101 GKRC040 GKRC106			
• GKRC097 GKRC040 GKRC102 GKD0010 GKRC107 GKRC055 GK	(RC115		
GKRC098 GKRC099 GKRC102 GKRC020 GKC108 GKRC056 GK	C116 • GKRC093		
GKD007 GKRC104 GKRC020 GKRC100 GKRC105 GKRC1	17 • GKRC092		
GKD002 GKRC11() GKRC118	 GKRC063 		
GKRC029 GKRC111 CH2011 GKRC119	GKRC064		
● GKD004 ● GKD008 GKRC03● GKRC118 ■ GKRC120 ●	GKRC065	GKRC159	
● GKRC031 ● GKRC061 ● GKRC121 ● GKR	(RC066		
● GKRC062 ^{·/} ● GKR012 [●] GKR(C067 • • cvpc		
• GKRC0/	68 • GKRC	• GKRC077	
GKRC032		GKRC078	
	GKRC072	GKRC079	•
• GKD005	GKRC073		• GI
• GKRC007	GKRC074	GKRC080	• GKR
	GKRC075	GKRC081	GKRCI
GKRC008	•	GKRC082	GKRC088

To display the cross section, select the **Plot Drill Section** option of from the Drillholes dropdown menu.





At this point, only the drill hole traces are created. To add assay and/or geology data, select the option to display downhole data.

Choose required data to display, plus the method of display..

Drillhole Display - Downhole Data Display							
Avai	lable Settings	Current	-	Use	Save Remove]	
Data Display Settings							
1	Gokona_Assay	💽 🖌 Au	_ppm	•	Trace Shade 💌	🕘 📃 🗖 Data Le	egend
2	None	_		7	_	🛛 🗌 🗖 Histogr	am Scale
3	None	•		7	_	🛛 🗖 Surface	e ID
4	None	-		7	_	3	
5	None	•		7	_	3	
6	None	•		~	-	3	
7	None	•		-	-	3	
8	None	•		-	-	3	
9	None	•		-		3	
10	None	•		7		3	
11	None	•		~	-	3	
12	None			-	-	3	
13	None	•		7	_		
14	None	•		~			
15	None			7		Cancel	
16	None	•		v	<u>_</u>	Help	

The results are drawn into the cross section window.



To save the settings, save a workspace (File >> Save Workspace).