

Making Discover Live

Integrating Esdat with Discover

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GHD



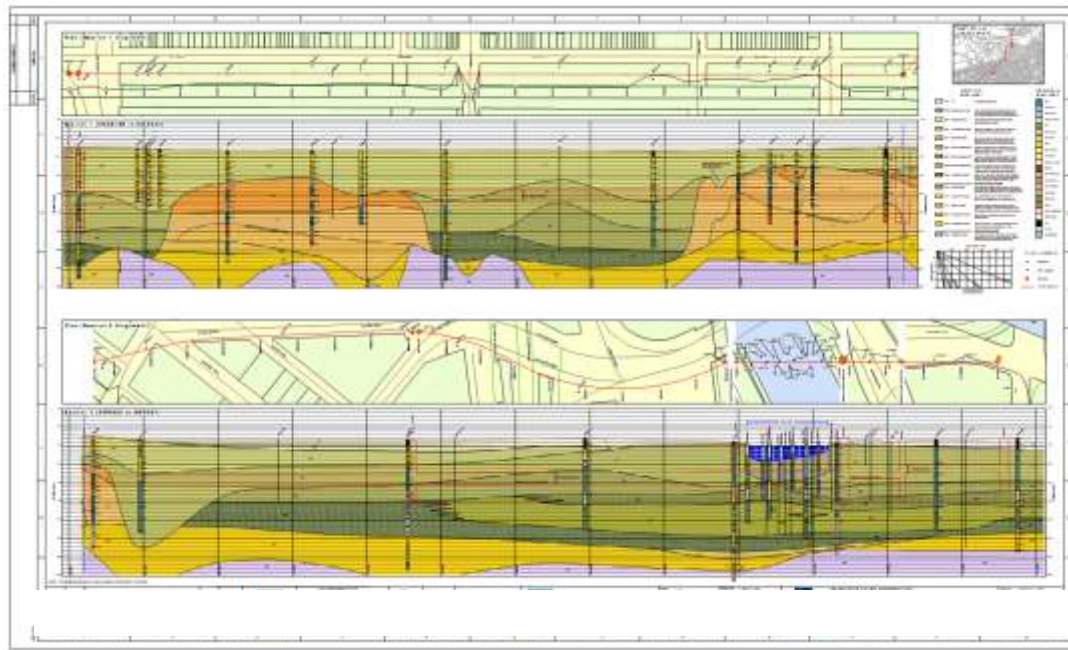
CLIENTS | PEOPLE | PERFORMANCE

Overview

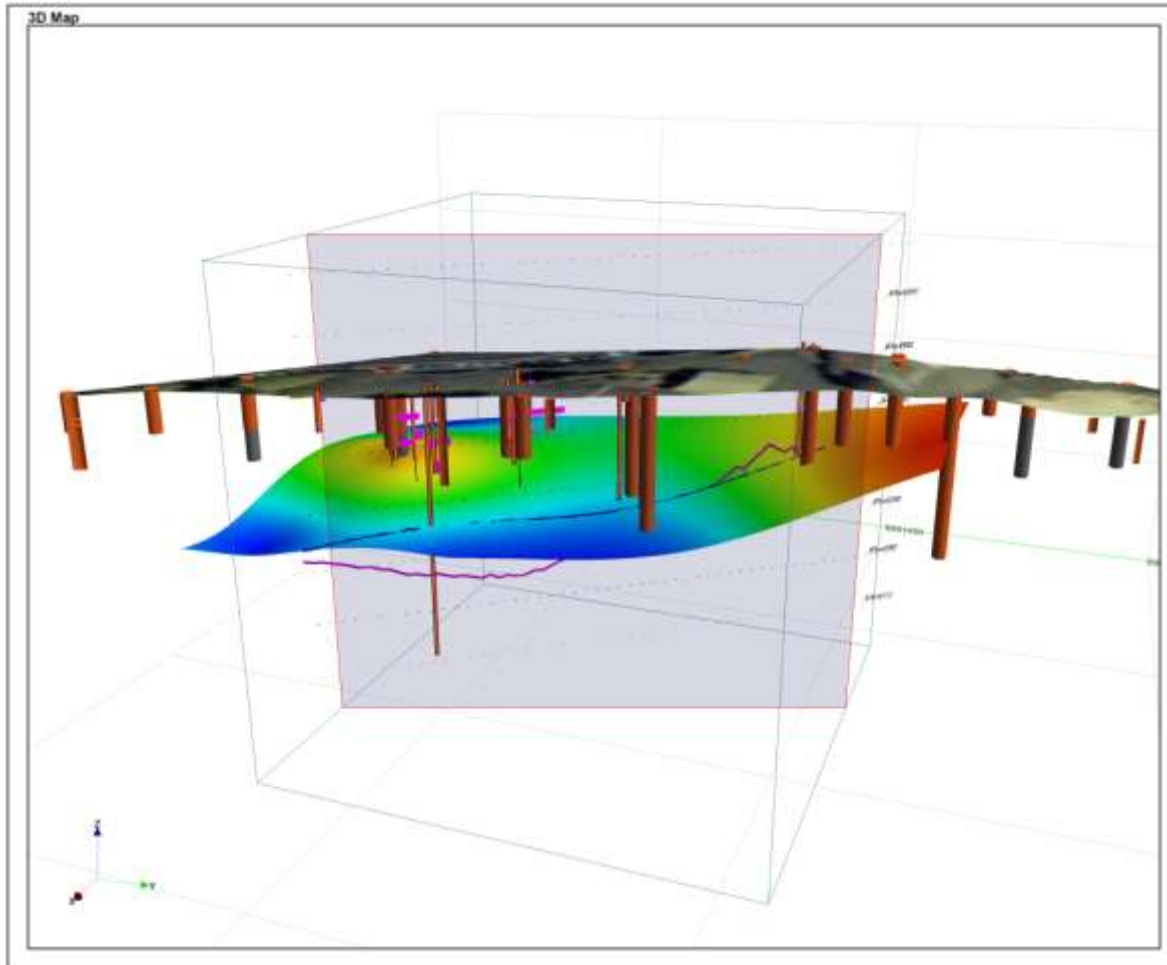
- GHD is an professional services consultancy – 6000+ staff and offices in Australia, Middle East, Asia & Americas.
- GIS used extensively within GHD with a GIS service group supporting internal & external clients.
- A significant presence in contaminated land, mining, geophysics, geotechnical and Hydrogeology disciplines – The hole diggers, gold diggers and mud movers.
- How do we optimise data collection and analysis and minimise data handling? One method presented

Display - Encom Discover

- A need to analyse and represent downhole information on a daily basis. Discover being a preferred tool
- Discover works with MapInfo tables & native formats
- Discover enables earth science data in 2d and 3d



Display - 3d



Storage - Data management

- Earth science data:
 - Complex relational database model
 - Live
 - Ongoing reporting requirements
- ESDAT is GHD's earth sciences database
 - Good Datamodel for earth sciences (lithology, hydrology, Geotechnical, Chemistry)
 - Flexible
 - Simple methods for capturing field data
 - Integrated outputs: Borelogs/ 2d Maps/ Reports/ QA/ Charting
 - However No sections or 3d analysis. Exports data to MI

ESDAT (www.esdat.com.au)

ESDAT Project: Sample Hydrogeology and Contam

File Edit View Map Import Check Units Reports Specs

Locations Database/Works Geology Well Logs Samples Water Chemistry Soil/Block Chemistry Gas Chemistry Streamflow/Runoff

Filter (OFF)

LocCode	WellCode	Date Time	Monitoring Point	Monitoring Unit	Water Level	Units	Measurement
BH01	A	03 Dec 09	Lower Aquifer		32.61 m	dp	
BH01	A	02 Jan 10	Lower Aquifer		32.7 m	dp	
BH01	A	06 Feb 10	Lower Aquifer		32.7 m	dp	
BH01	A	11 Mar 10	Lower Aquifer		32.21 m	dp	
BH01	A	25 Apr 10	Lower Aquifer		41.2	dp	
BH01	A	14 Apr 10	Lower Aquifer		32.91 m	dp	
BH02	A	09 Dec 09	Lower Aquifer		26.56 m	dp	
BH02	A	01 Jan 10	Lower Aquifer		26.54 m	dp	
BH02	A	05 Feb 10	Lower Aquifer		26.52 m	dp	
BH02	A	12 Mar 10	Lower Aquifer		26.55 m	dp	
BH02	A	28 Apr 10	Lower Aquifer		26.57 m	dp	
BH02	A	06 May 10	Lower Aquifer		26.57 m	dp	
BH03	B	08 Dec 09	Upper Aquifer		24.16 m	dp	
BH03	B	01 Jan 10	Upper Aquifer		27.06 m	dp	
BH03	B	12 Mar 10	Upper Aquifer		24.15 m	dp	
BH03	B	26 Apr 10	Upper Aquifer		24.14 m	dp	
BH03	B	06 May 10	Upper Aquifer		24.12 m	dp	
BH05	A	09 Dec 09	Lower Aquifer		26.7 m	dp	
BH05	A	01 Jan 10	Lower Aquifer		25.88 m	dp	
BH05	A	05 Feb 10	Lower Aquifer		26.61 m	dp	
BH05	A	12 Mar 10	Lower Aquifer		26.66 m	dp	
BH05	A	26 Apr 10	Lower Aquifer		26.66 m	dp	
BH05	A	06 May 10	Lower Aquifer		26.61 m	dp	
BH05	B	08 Dec 09	Upper Aquifer		26.72 m	dp	
BH05	B	01 Jan 10	Upper Aquifer		26.73 m	dp	
BH05	B	05 Feb 10	Upper Aquifer		26.72 m	dp	
BH05	B	12 Mar 10	Upper Aquifer		26.79 m	dp	
BH05	B	26 Apr 10	Upper Aquifer		26.8 m	dp	
BH05	B	06 May 10	Upper Aquifer		26.76 m	dp	
BH07	A	08 Dec 09	Lower Aquifer		27.01 m	dp	
BH07	A	01 Jan 10	Lower Aquifer		26.63 m	dp	

Geodetic (unprojected) = 4341.15336448527, y = 2064.22967138991

7/06/2010 8:19 PM

Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

AM22

Iron Filtered

Sodium Filtered

Legend: B618B1 (blue line with dots), ANZECC (1992) Freshwater (dashed line), ANZECC (2000) (solid line)

Field ID	BH01 2-3	BH01 3-4	BH01 5-6	BH02 1.1-1
LocCode	BH01	BH01	BH01	BH02
Depth Range	2-3	3-4	5-6	1.1-1.4
Date Time	8 Jan 2004	8 Jan 2004	8 Jan 2004	8 Jan 2004
Description	Slight Petroleum Smell			

ChemName	Units	EQL	Dutch Intervention	USEPA PRC (Action Set)				
BTEX								
Benzene	mg/kg	0.001	1	1.3	0.002	0.002	0.075	<0.001
Ethylbenzene	mg/kg	0.001	50	100	<0.001	<0.001	0.012	<0.001
Toluene	mg/kg	0.001	130	250	300	300	0.001	<0.001
Xylene (m & p)	mg/kg	0			<0.002	<0.002	0.006	
Xylene (o)	mg/kg	0.001			<0.001	<0.001	0.002	<0.001

Figure 4121702 BIRKDALE Redlands City Council Site 1 - Birkdale Landfill

Prep Name: [blank], Radio Stamm: [blank], Author: [blank], Date: [blank], Original: [blank], Rev: [blank], Job Number: 4121702 BIRKDALE

GHD

Chart: Calcium Filtered, Chart 1

Ready NUM



Field QC

Duplicates (RPD)
Blanks
Etc..

Lab QC

Holding times
Ionic Balance
Surrogates
etc..

	Arsenic	Arsenic (Filtered)	Calcium	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Lead	Lead (Filtered)	Magnesium
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
EGL	0.005	0.001	0.1	0.005	0.001	0.005	0.001	0.05	0.005	0.001	0.1
ANZECC 2000 freshwater 95%				0.001	0.001	0.0014	0.0014		0.0034	0.0034	
EPA 1994 Freshwater									0.001	0.001	
NFPM Drinking	0.007	0.007				2	2		0.01	0.01	

LocCode	WellCode	Sampled_Date-time	Arsenic	Arsenic (Filtered)	Calcium	Chromium	Chromium (Filtered)	Copper	Copper (Filtered)	Iron	Lead	Lead (Filtered)	Magnesium
BH10		27-Feb-04	-	-	-	0.0736	0.0225	0.0045	0.0036	4.77	0.0054	0.0054	0.9
BH10	A	30-Jan-04	-	-	-	0.082	0.025	0.005	0.004	5.3	0.006	0.006	1
BH10	A	30-Mar-04	-	-	-	0.082	0.025	0.005	0.004	5.3	0.006	0.006	1
BH2	A	30-Jan-04	-	0.004	-	-	<0.001	-	<0.001	-	-	<0.001	-
BH2	A	27-Feb-04	-	0.0036	-	-	<0.0009	-	<0.0009	-	-	<0.0009	-
BH2	A	30-Mar-04	-	0.004	-	-	<0.0009	-	<0.0009	-	-	<0.0009	-
BH21	A	30-Jan-04	<0.005	-	-	<0.001	-	-	-	-	-	-	-
BH21	A	27-Feb-04	<0.0045	-	-	<0.001	-	-	-	-	-	-	-
BH21	A	30-Mar-04	<0.005	-	-	<0.001	-	-	-	-	-	-	-
BH23	A	30-Jan-04	-	-	-	0	-	-	-	-	-	-	-
BH23	A	27-Feb-04	-	-	-	0	-	-	-	-	-	-	-
BH23	A	30-Mar-04	-	-	-	0	-	-	-	-	-	-	-
BH24	A	30-Jan-04	-	-	-	0	-	-	-	-	-	-	-

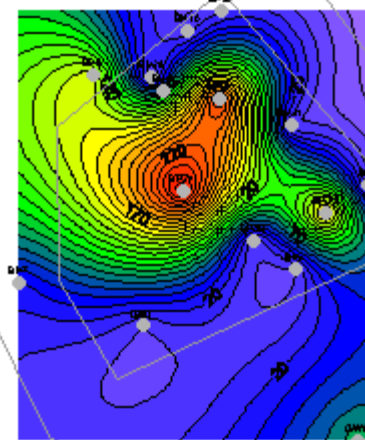
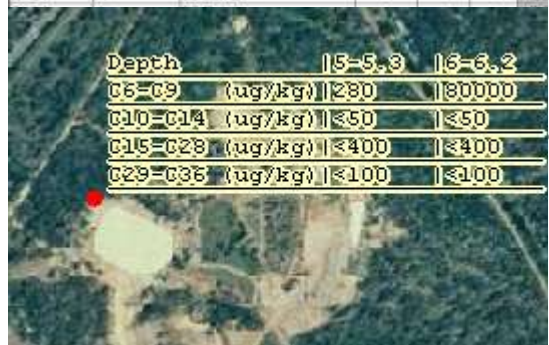
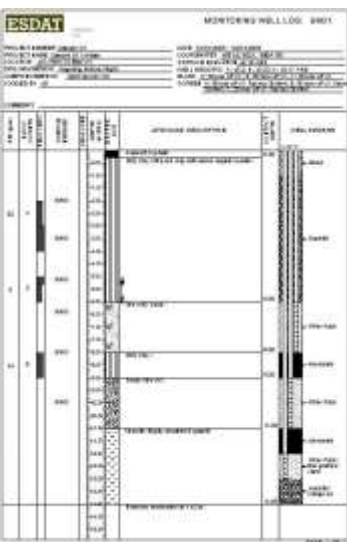
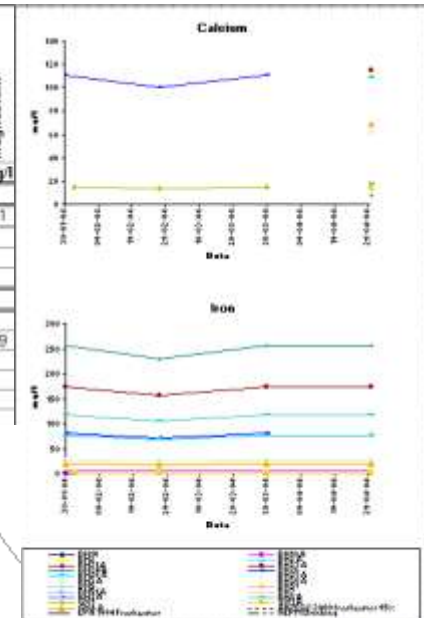


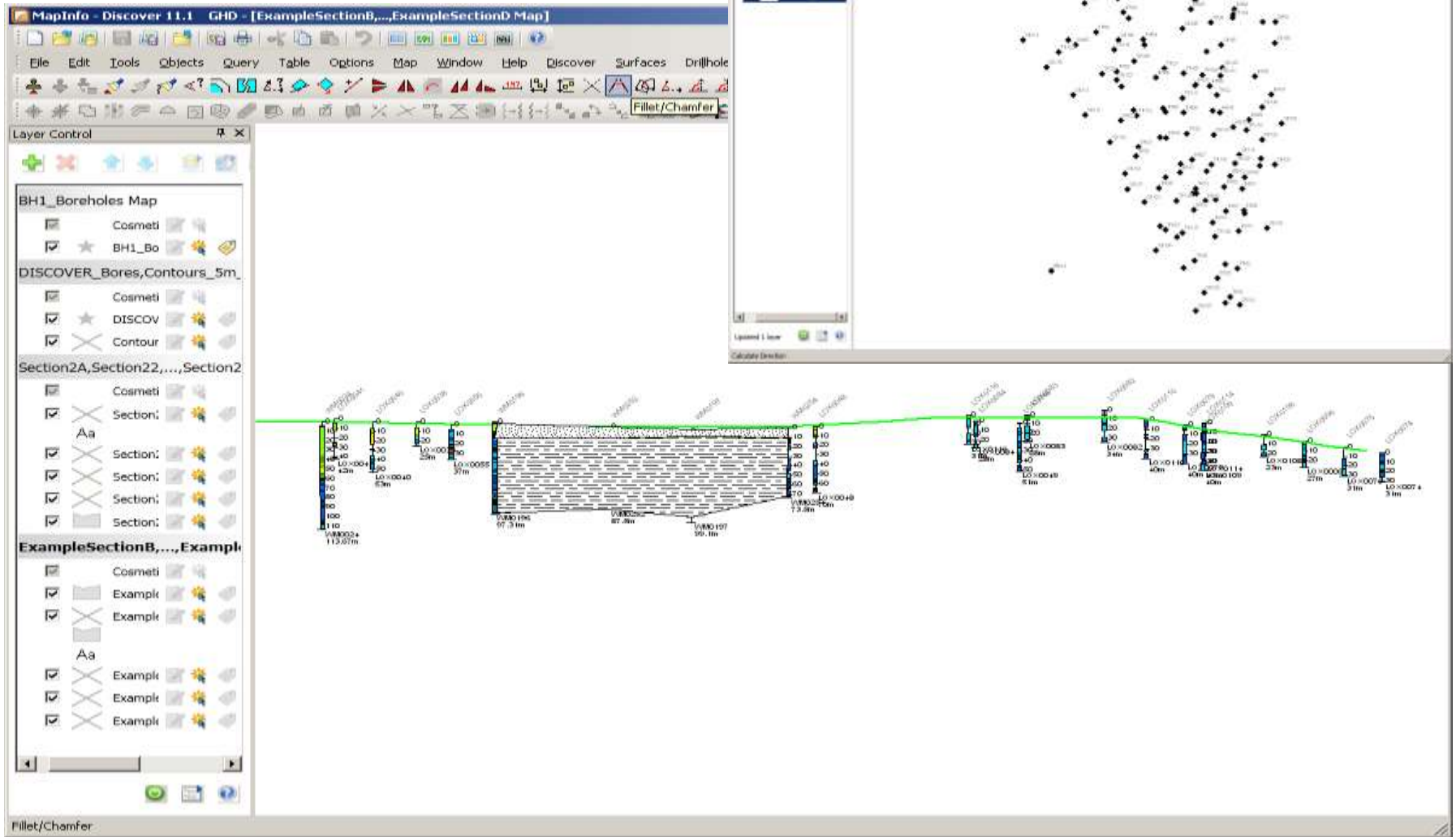
Figure 12
Calcium and Iron Timeseries
concentrations.

Solution: Make Discover Data Live

Utilise database queries rather than base tables via ODBC links

- Build queries in RDB to format data for Discover
 - *Bore Header: (X, Y) *2, Z, BoreID, Depth, angle, bearing*
 - *Downhole: BoreID & the same DepthFrom, DepthTo*
- Make Bore Header DBMS table mappable
- Open Data in MapInfo as Linked tables
- Create Discover Borehole Project
- Refresh live data from the DB as needed

MapInfo displays



Benefits

- Data is centrally managed – One point of truth.
- Live - minimal exports.
- Data corrections carry through work process rather than just at outputs.
- Data source usable for multiple applications.
- Power of relational databases for queries can be used.
- Esdat or other datamodels (eg state borehole databases) can be utilised.
 - 3d Eye candy.