

# Making Discover Live

## Integrating Esdat with Discover

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GHD



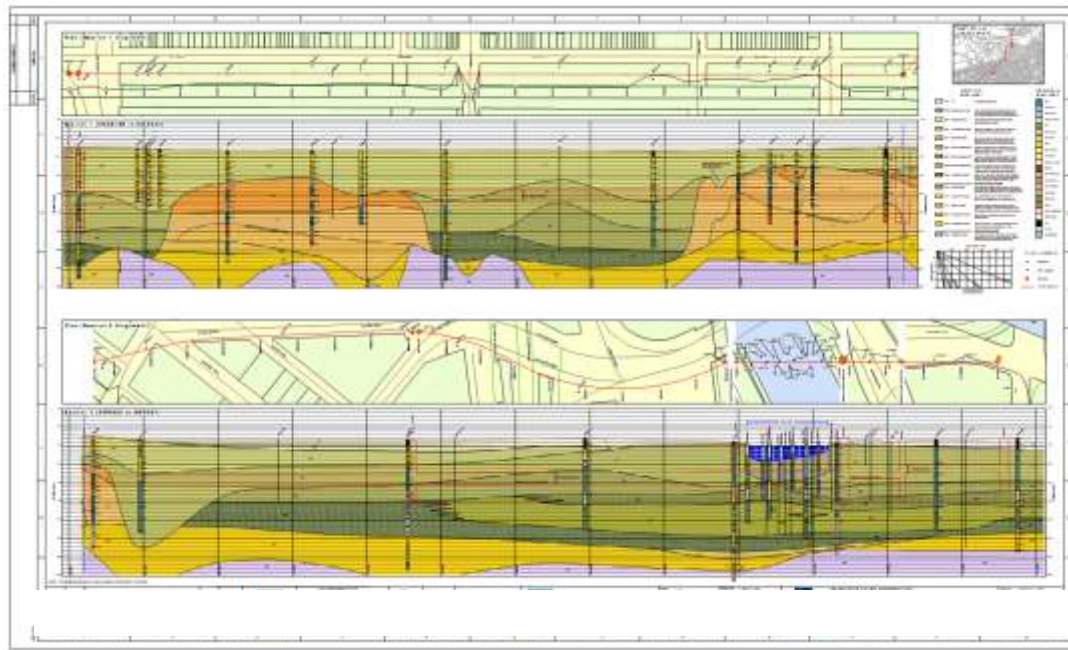
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# Overview

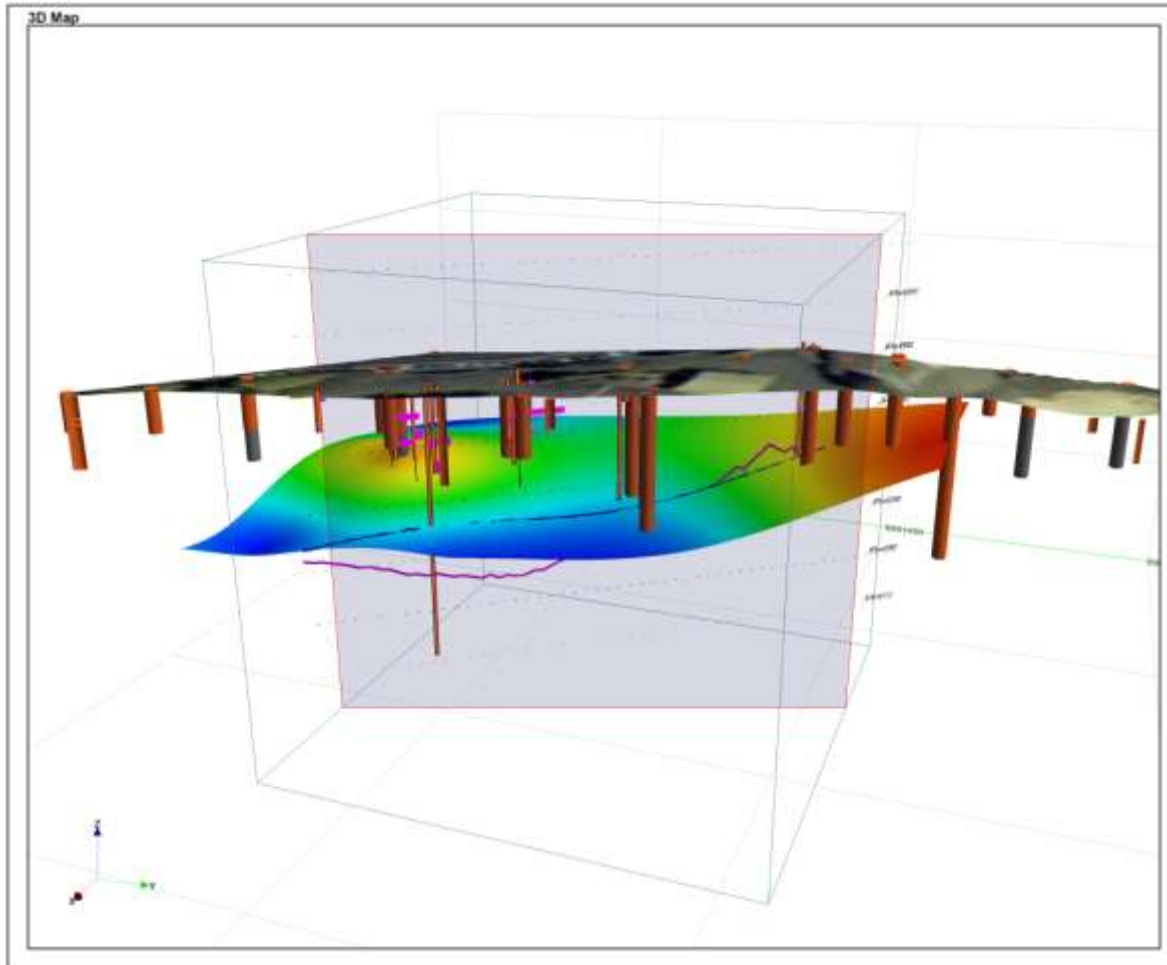
- GHD is an professional services consultancy – 6000+ staff and offices in Australia, Middle East, Asia & Americas.
- GIS used extensively within GHD with a GIS service group supporting internal & external clients.
- A significant presence in contaminated land, mining, geophysics, geotechnical and Hydrogeology 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/Work 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		26.83 m	dp		

Geodetic (unprojected) = 4341.15336448527, y = 2064.22967138991

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Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

AM22

Figure

4121702 BIRKDALE  
Redlands City Council  
Site 1 - Birkdale Landfill

ChemName	Units	EQL	Dutch Intervention	US EPA PRC (Action Set)	BH01 2-3	BH01 3-4	BH01 5-6	BH02 1.1-1
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

Chart: Calcium Filtered

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	-	-	-	-	-	-	-

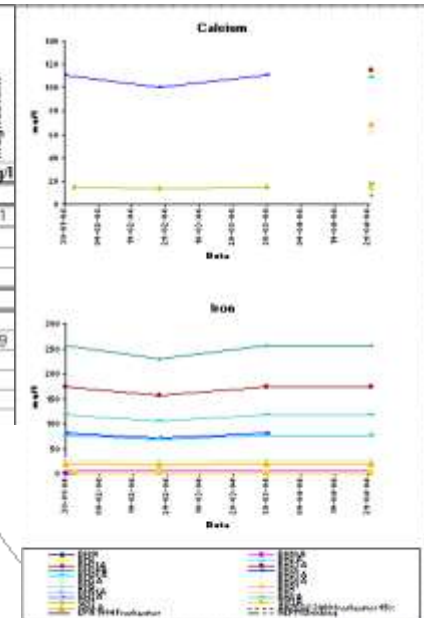
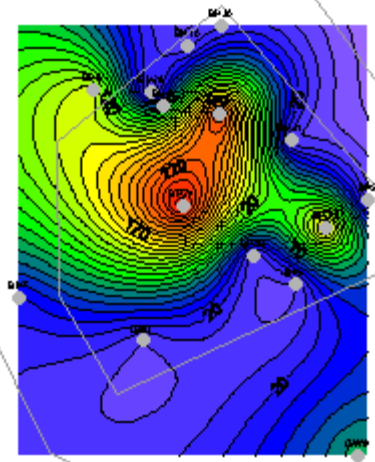
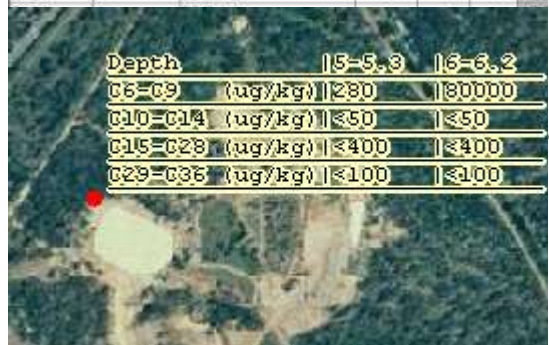
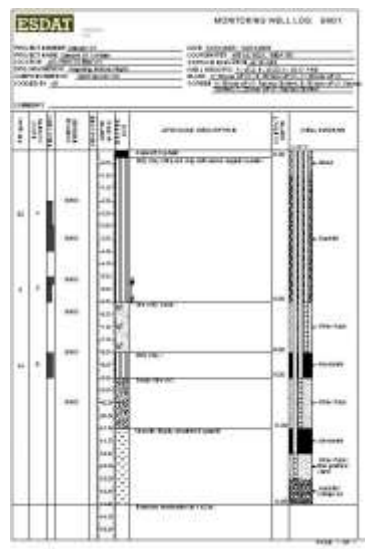


Figure 12  
Calcium and Iron Timeseries  
concentrations.



# 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





# 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.