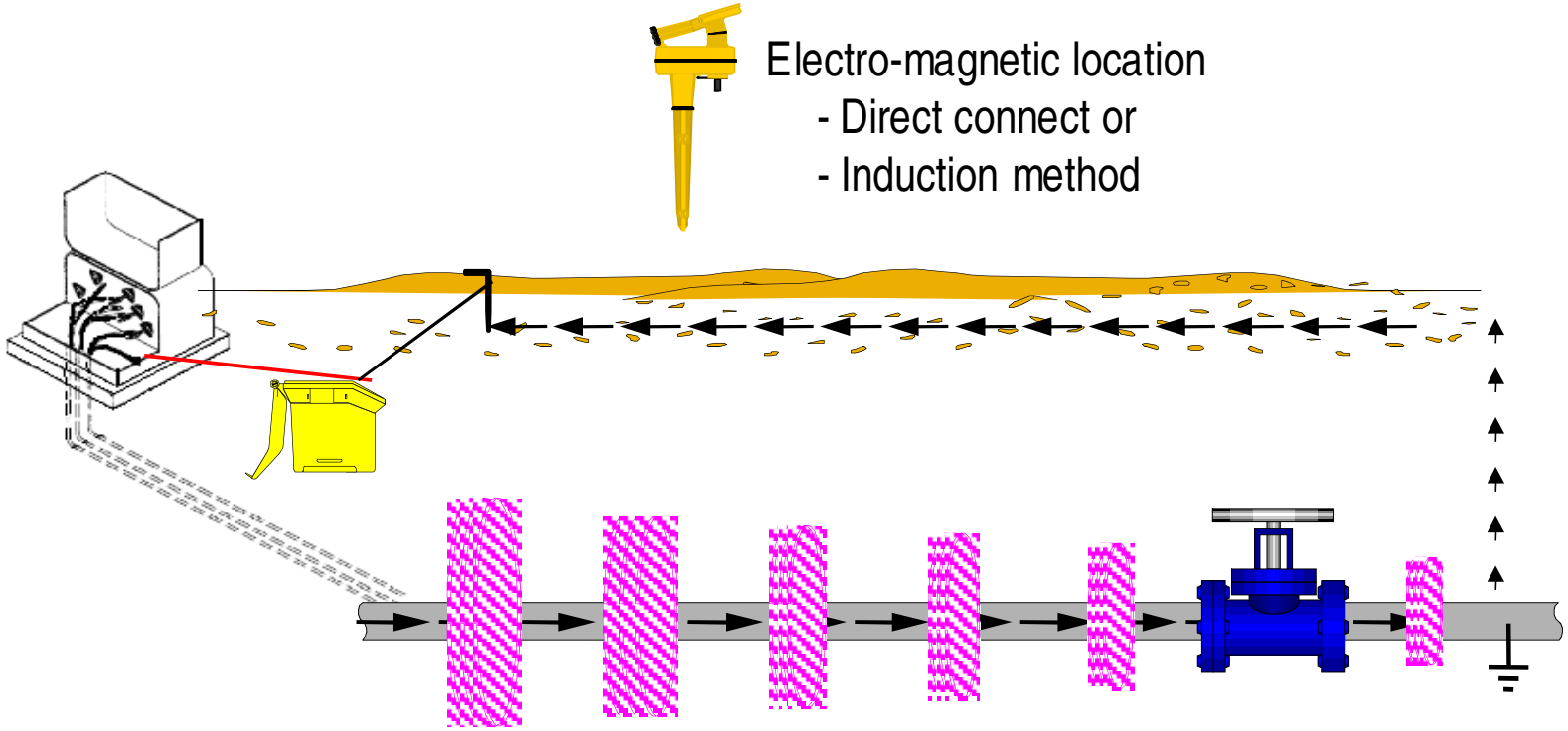
3M™ Dynatel™ Locating and Marking Technologies

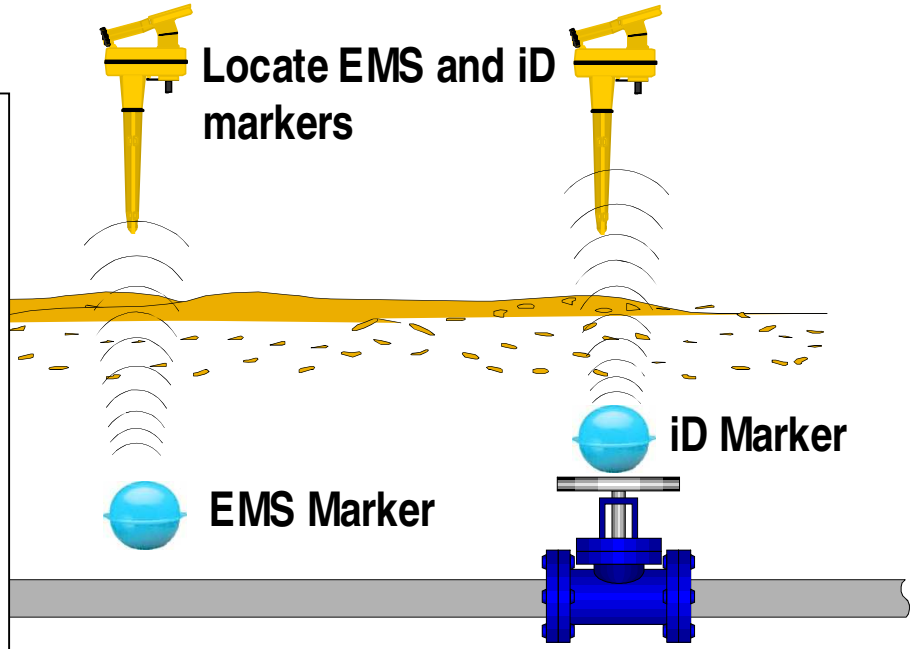
Dynatel Pipe and Cable Locators (Electro-magnetic)



- 30 + years of experience and innovation.
- Range of analogue and digital locators.
- Best in class for ground fault locating accuracy.
- Reliable, rugged and ergonomically designed.

Electronic Marker System Overview

- Markers are passive devices. (no battery)
- Area ‘swept’ with locator.
- Markers within ‘read range’ respond.
- Locator powers up marker.
- Marker is ‘read’ by locator.



- 1420-iD Locator – Electronic markers only (EMS and iD markers)
- M-iD range – All in one locator: pipe, cable, fault and marker locator

Electronic Marking - Three top applications

- Construction Access
  - Points that need to be accessed for future construction / facility expansion needs eg service stub connection points.
- Maintenance
  - Points needed for future maintenance
- Damage Avoidance
  - Indicate presence of key infrastructure e.g. non conductive plastic pipes or fibre optic cables, or the location of a lateral or tee where the direction of the facility may change or branch out.

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3M offer two types of electronic markers

- 3M EMS markers
  - Identifies type of underground facility - Power, Telephone, Water, Gas, Waste water, CATV, General Purpose.
  - Each marker responds at different frequency.
  - Tells locator '**here I am**' plus 'I am xyz utility' e.g. water, power.
- 3M iD markers
  - Contains microchip.
  - Provide same feedback as EMS marker **plus** '**what I am**' - asset and owner specific information - eg branch splice, conduit stub, owned by ABC organisation.

3M EMS Markers – How they work

The specific frequency is unique to the utility it marks.

EMS Markers contain a coil, tuned to a specific frequency.

3M EMS Markers – Placement

- Placed on top of facility during construction, repair or maintenance.
- 3M have recommend guidelines on placement

- Engineered for narrow trench applications up to 1.5m in depth.
- Ball markers have a unique, patented self-levelling feature that ensures an accurate, horizontal position regardless of how it is placed in the ground.
- Warranted for life of utility.

Finding EMS Markers

- User selects particular utility eg power, telephone, gas etc and sweeps area.
- The locator emits the utility's unique frequency (eg Power).
- Locator frequency energises the EMS marker coil in the power markers.
- It detects the power marker's 'reflection' of that signal.
- Strong 'reflection' means close proximity to marker.

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Range of iD Markers

Near Surface 0.6m depth  iD Option	Ball Marker 1.5m depth  iD Option	Disk Marker 1.5m depth  iD Option	
		Full Range 2.4m depth  iD Option	


Telephone


Gas


CATV


Power


Water

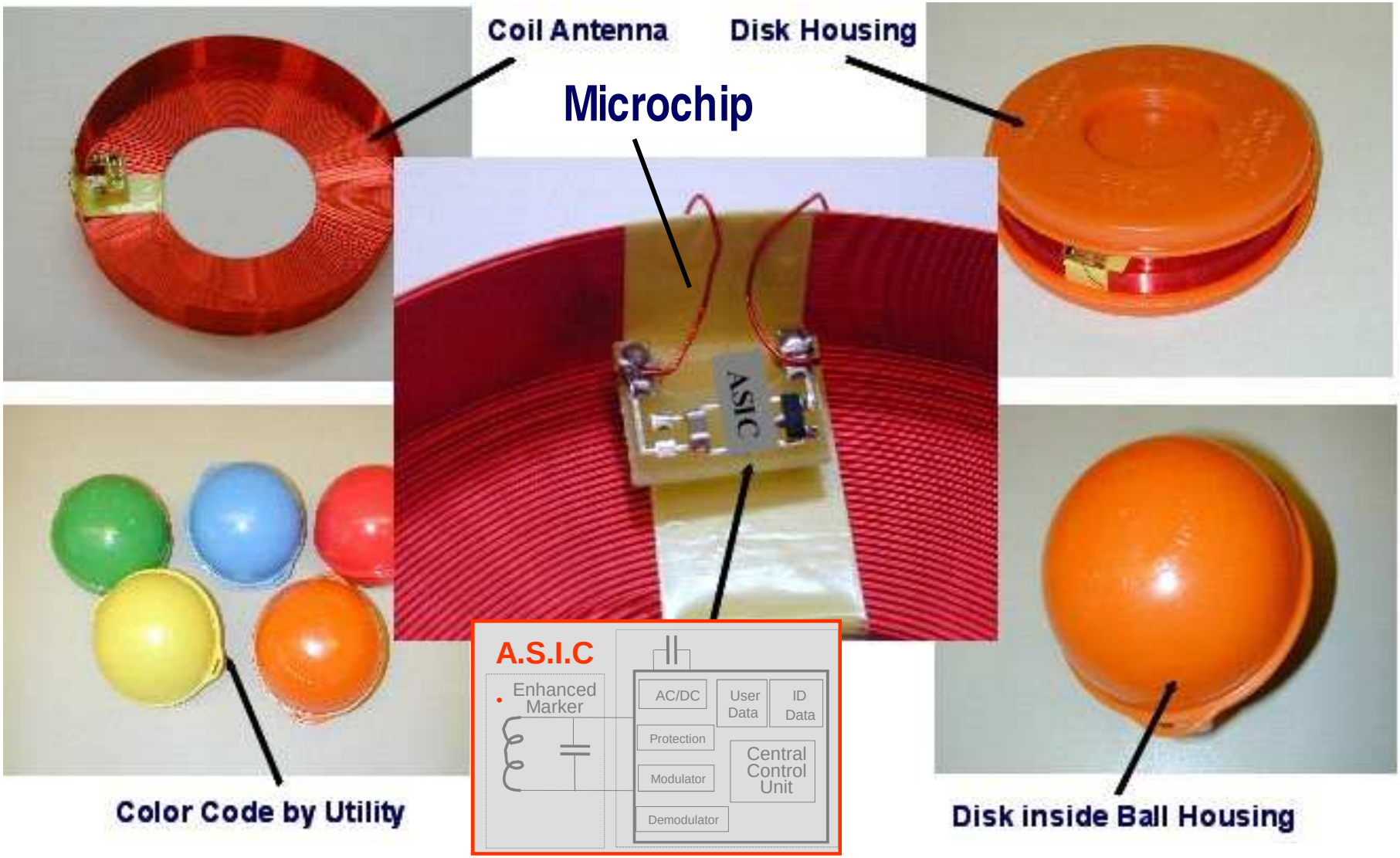

Wastewater


Gen Pur.

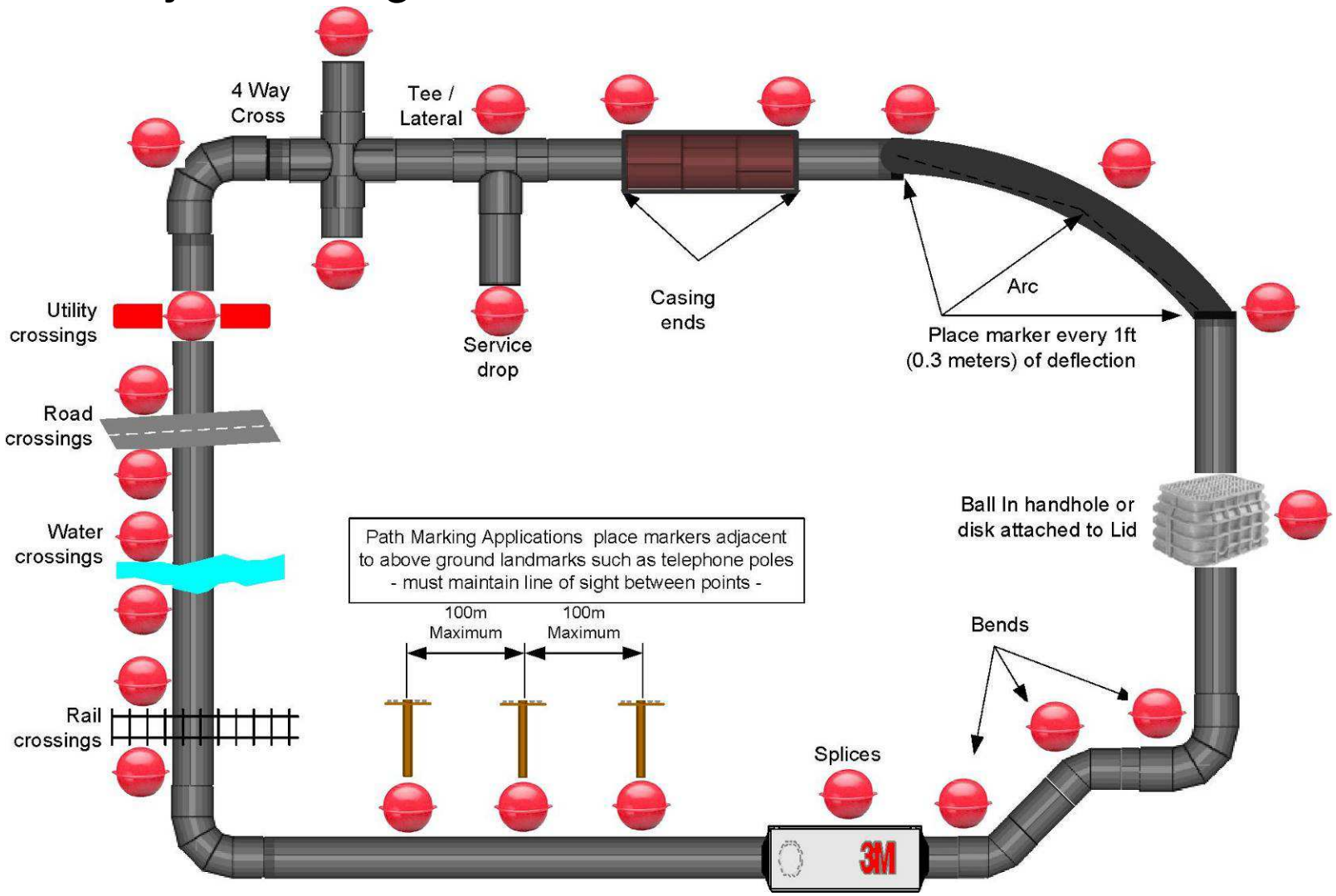
iD Markers

- iD markers contain a microchip which has a unique 10 digit serial number.
- Serial number also displayed on a barcode label.
- Marker programmed by user to include specific information
  - Customer information
  - Facility data
  - Type of application
  - Material type and size
  - Placement date
  - Other details relevant to asset owner

Construction of iD Markers



Gas Utility Marking – EMS and iD markers



Crossings	Service Stubs & Drops	Laterals & Tees
- Water	Primary & Secondary Splices	Empty Conduit Banks
- Major roads	Repair Splices	Conduit Openings
- Rail	Transition Splices	Handholes and Manholes

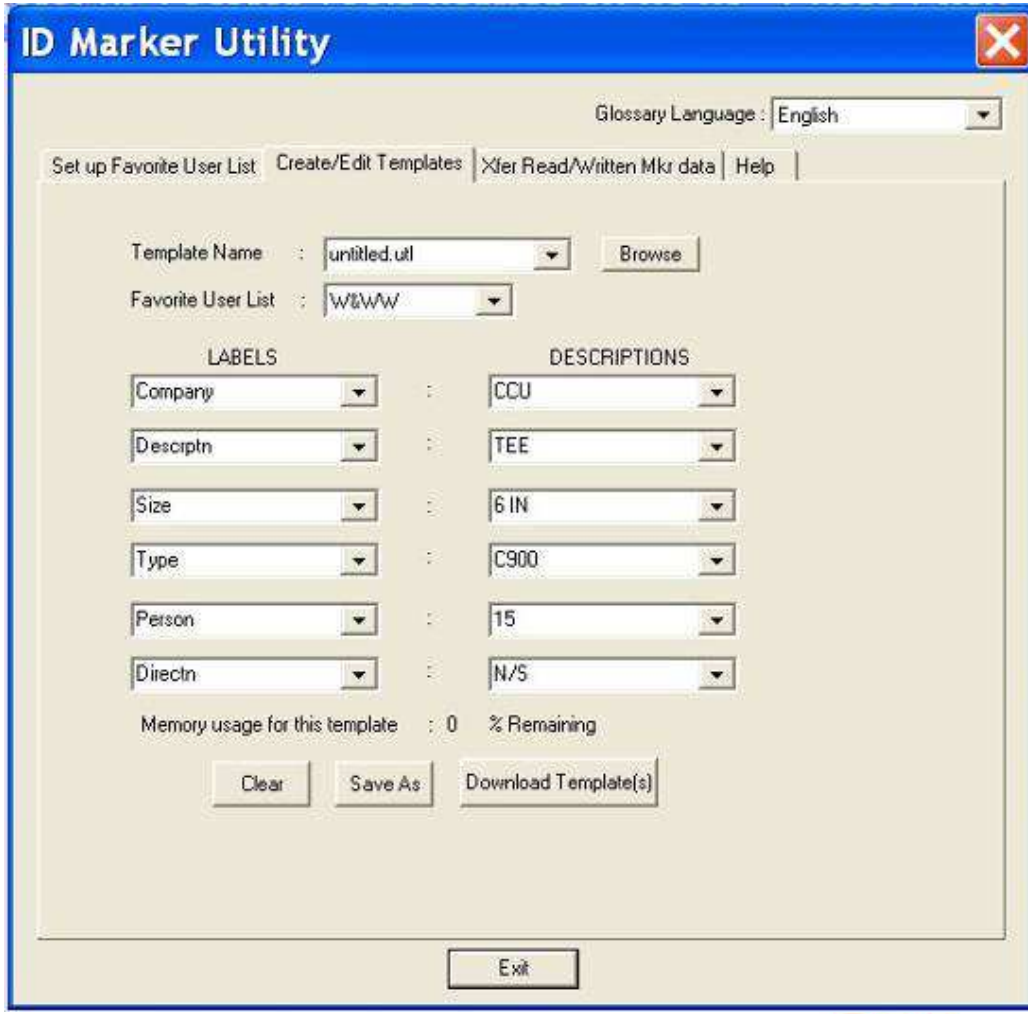
3M Electronic Markers in use

Installing 3M iD markers

Step 1: Set up customer specific templates using PC tools (once off) and downloads to locator

User defined data

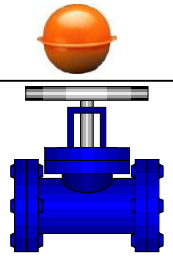
- 6 lines
- 8 character label per line
- 14 character description per line.
- Data locking option



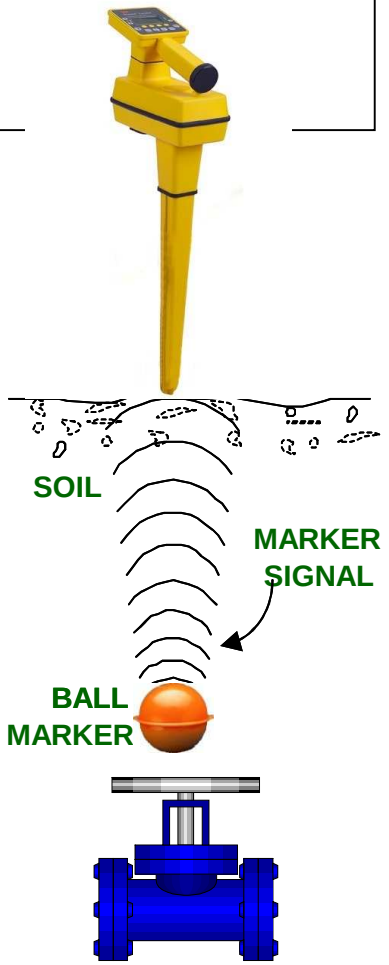
How it works

Step 2: Installer selects predefined template on locator based on asset type and programs asset specific information to iD marker.

Step 3: iD marker placed on point of interest



Step 4: Locator reads and records information stored on iD marker



Step 5: Recorded data exported from locator to GIS (via Trimble GPS)

Step 6: GPS Interface - delivering added benefits

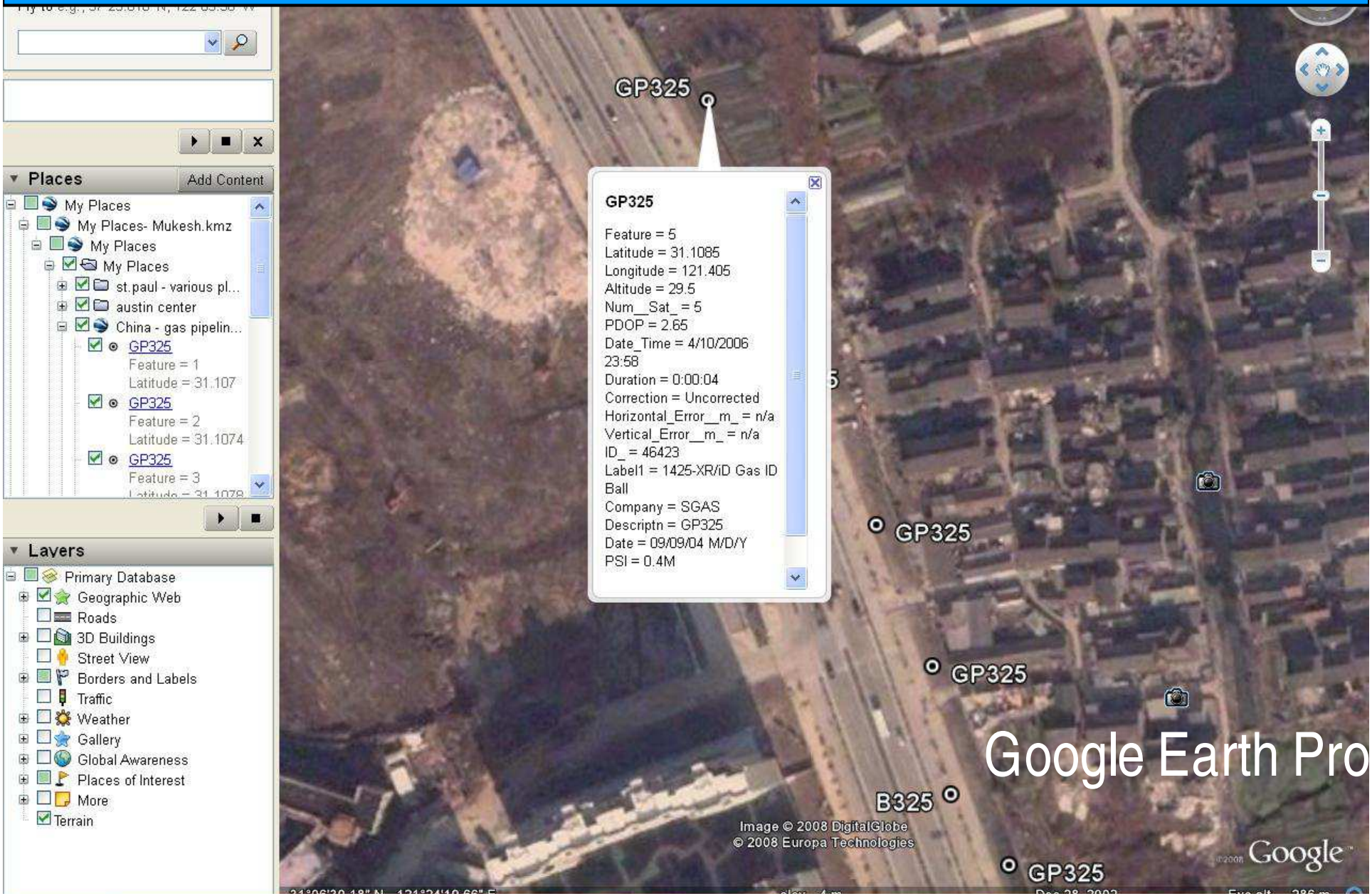
iD marker data and GPS coordinates saved on GPS with press on a button

Export GPS data to GIS/CAD system

- iD # 000-001-6710
- Marker:1425-XR-ID Water
- Company: XYZ
- Description: Valve
- Type: Steel
- Size: 100mm
- Direction: CW-Close-4T
- Lat: 30º 23’.65N
- Longitude: 97’50.34W

Data saved to GIS mapping system

View information on GIS System



Electronic Marker Locators

Stand Alone Marker Locator

1420-iD Locator

Integrated Cable/ Pipe & Marker Locator

M-iD Range
2250M-iD or 2273M-iD Locators

- Memory capacity
  - 100 Read/Write records
  - 32 user defined ID templates
- PC software exports read/write history
- Path traces and scans for marker simultaneously
- GPS interface

Benefits of 3M iD markers to facility owners

- Saves time and money- simple and easy to use.
- ID markers offers speed, accuracy and confidence in point locating.
  - Inspection of contractors work is eliminated
  - Markers are clearly identified on maps
  - No Questions about positive identification
- Serial number can be used as an asset tag.
- GPS/GIS/CAD interface - saves up to 80% of time field mapping.
- Single button on locator remotely commands the GPS

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With 3M iD markers you've got it's number