



# ArcGIS & 3D Simulation Life of Field Planning Tool

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# ArcGIS & 3D Simulation Life of Field Planning Tool



## ■ Outline Brief of ArcGIS and VROV Capability

- Why we did this?
- What does it do for us
- Additional benefit it provides

# ArcGIS & 3D Simulation Life of Field Planning Tool



## ■ Why we did this?

- Gendalo & Gehem required a tool to enable field layout architecture to be established
- ArcGIS already utilized within CVX community
- Tool enabled global field from onshore facility to subsea wells to be visualized
- Enabled project decisions to be made based on comprehensive and accurate data

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## ■ What Does it Do For Us

- Enables CVX to generate/manage **field layouts in-house**
- Reduces project risk by enabling field layout to be **established early** in project life
- Provides a structured mechanism for field layout generation **compatible with other GIS** based disciplines
- Maintains project historical data in **centralized location** (CVX server)
- Latest revision **drawings controlled** and readily exported from data base
- **All disciplines represented** in single field layout design tool
- Enables field layout **solutions to be verified** utilizing 3D simulation
- Provides **life of field** support
- Provides information **link to e-room**

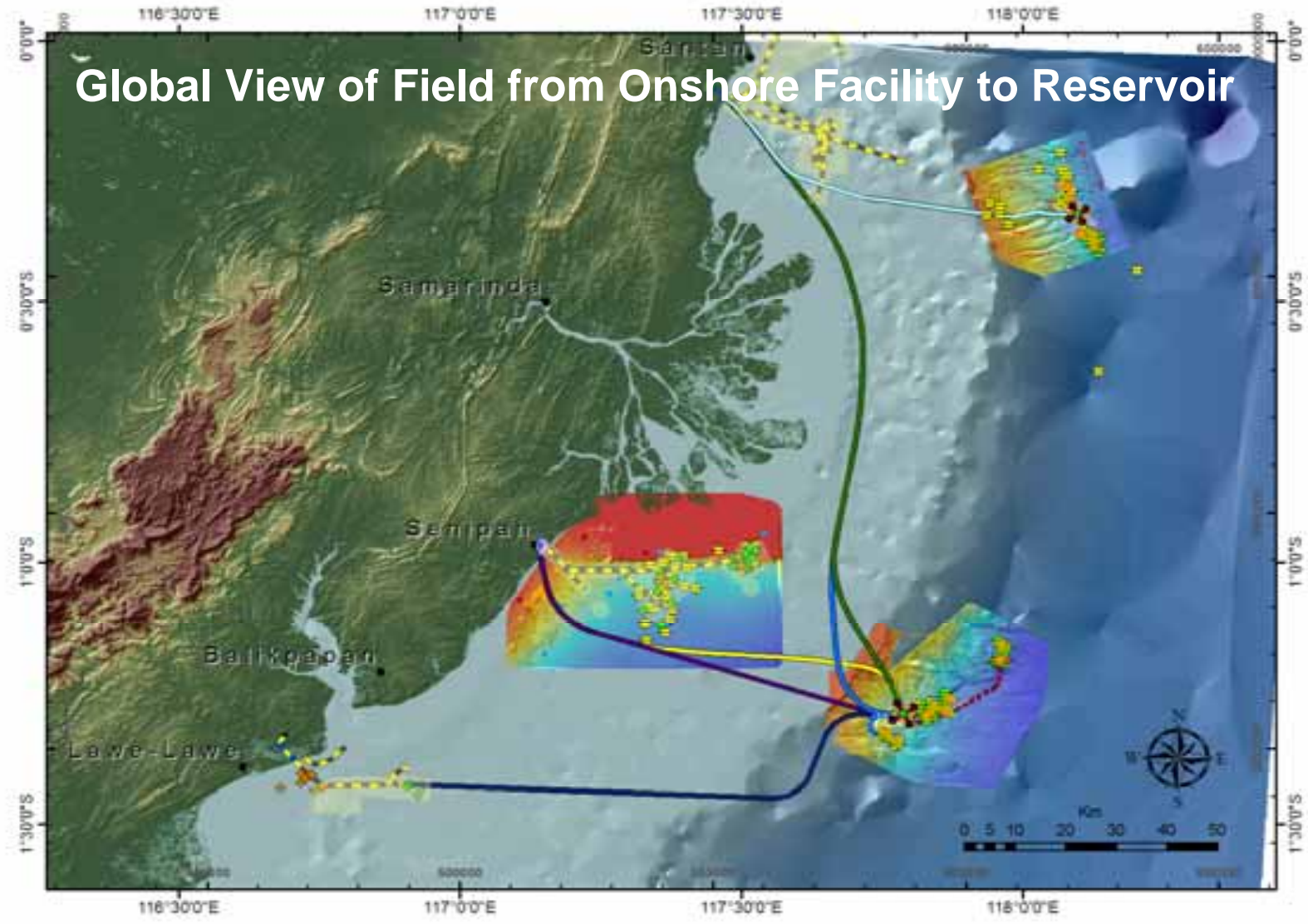
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## ■ Additional Benefit It Provides

- Utilizes existing data available within CVX to **generate seabed maps** (3D seismic /AUV)
- Enables equipment to be installed in **flat terrain** free from surface and subsurface geo-hazards.
- Enables equipment **clash checks** (host moorings, MODU moorings, flowline routes)
- Enables pipeline / flowline deployment scenarios to be verified (lay away from host / anchor lengths)
- Enables pipeline to be routed to **facilitate flow assurance**
- Enables pipelines to be routed clear of **geo-hazards**
- Enables completion and tree's to be **positioned accurately** relative to drill center
- Enables desk top metrology and **early jumper fabrication**. Early jumper fabrication improves first oil
- All components and critical interfaces **uniquely tagged**

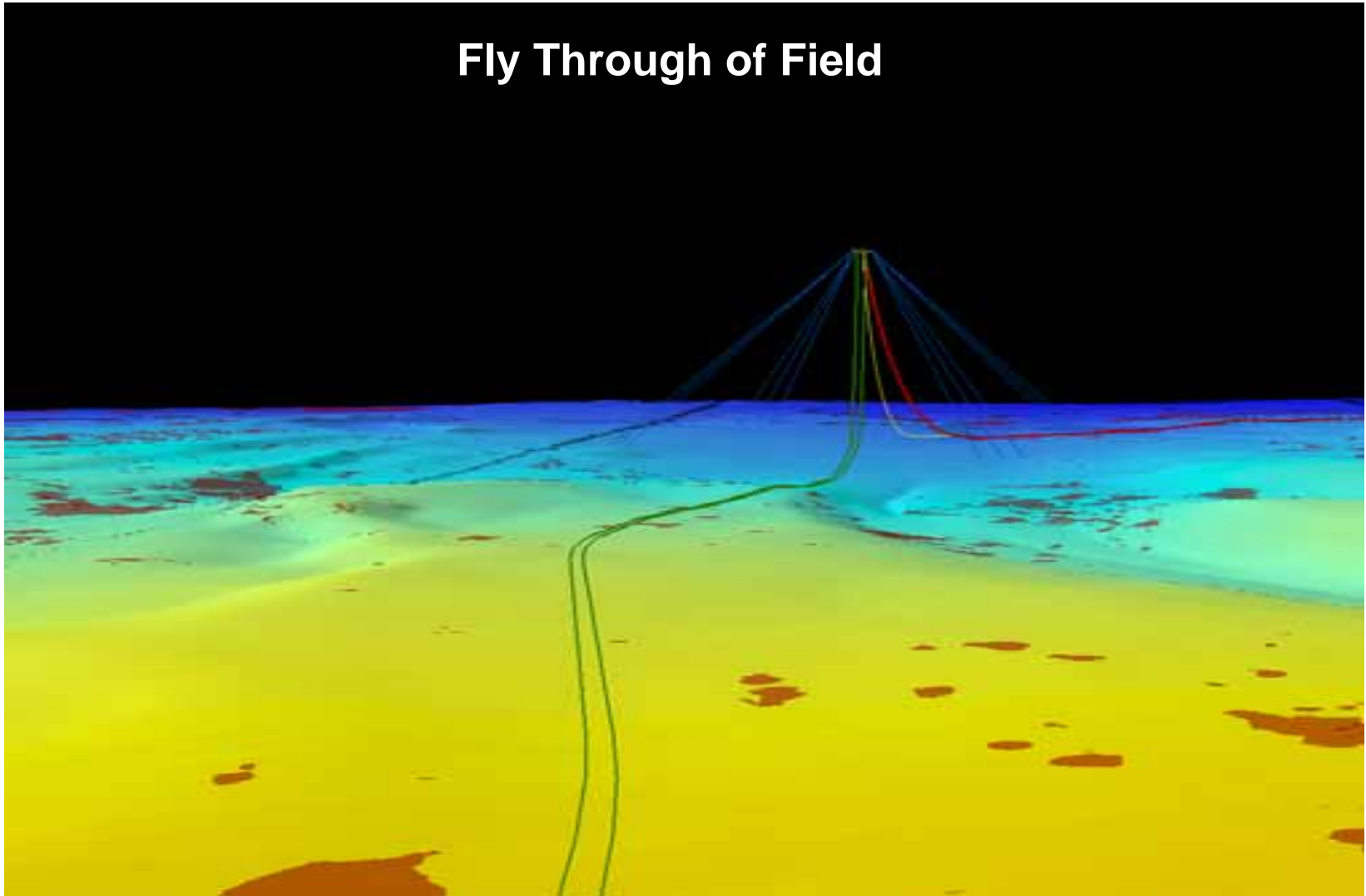
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## Fly Through of Field



# ArcGIS & 3D Simulation Life of Field Planning Tool



## Working With Data in ArcGIS Video

**ARC GIS FIELD LAYOUT  
PLANNING AND  
DEVELOPMENT TOOL**





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## VROV Simulation Tool Video



# ArcGIS & 3D Simulation Life of Field Planning Tool

## Example of Database – Subsea Equipment



Attributes of Equipment

| FID | Shape    | Sub_Theme | Date_Entred | Author     | Taglum_Key              | Abbrev | Conn_From | Conn_To | Loc_Name               |
|-----|----------|-----------|-------------|------------|-------------------------|--------|-----------|---------|------------------------|
| 0   | Point ZM | Manifold  | 1/1/1901    | Gus Colyer | GEH_SSE_MFLD12_03_01_00 | MFLD12 | NA        | NA      | Gehem SWC Manifold-12H |
| 16  | Point ZM | Well      | 1/1/1901    | Gus Colyer | GEH_SSE_WELHED_03_01_00 | WELHED | NA        | NA      | Gehem SWC WELHED       |
| 17  | Point ZM | Well      | 1/1/1901    | Gus Colyer | GEH_SSE_WELHED_03_02_00 | WELHED | NA        | NA      | Gehem SWC WELHED       |
| 18  | Point ZM | Well      | 1/1/1901    | Gus Colyer | GEH_SSE_WELHED_03_03_00 | WELHED | NA        | NA      | Gehem SWC WELHED       |

Attributes of Equipment

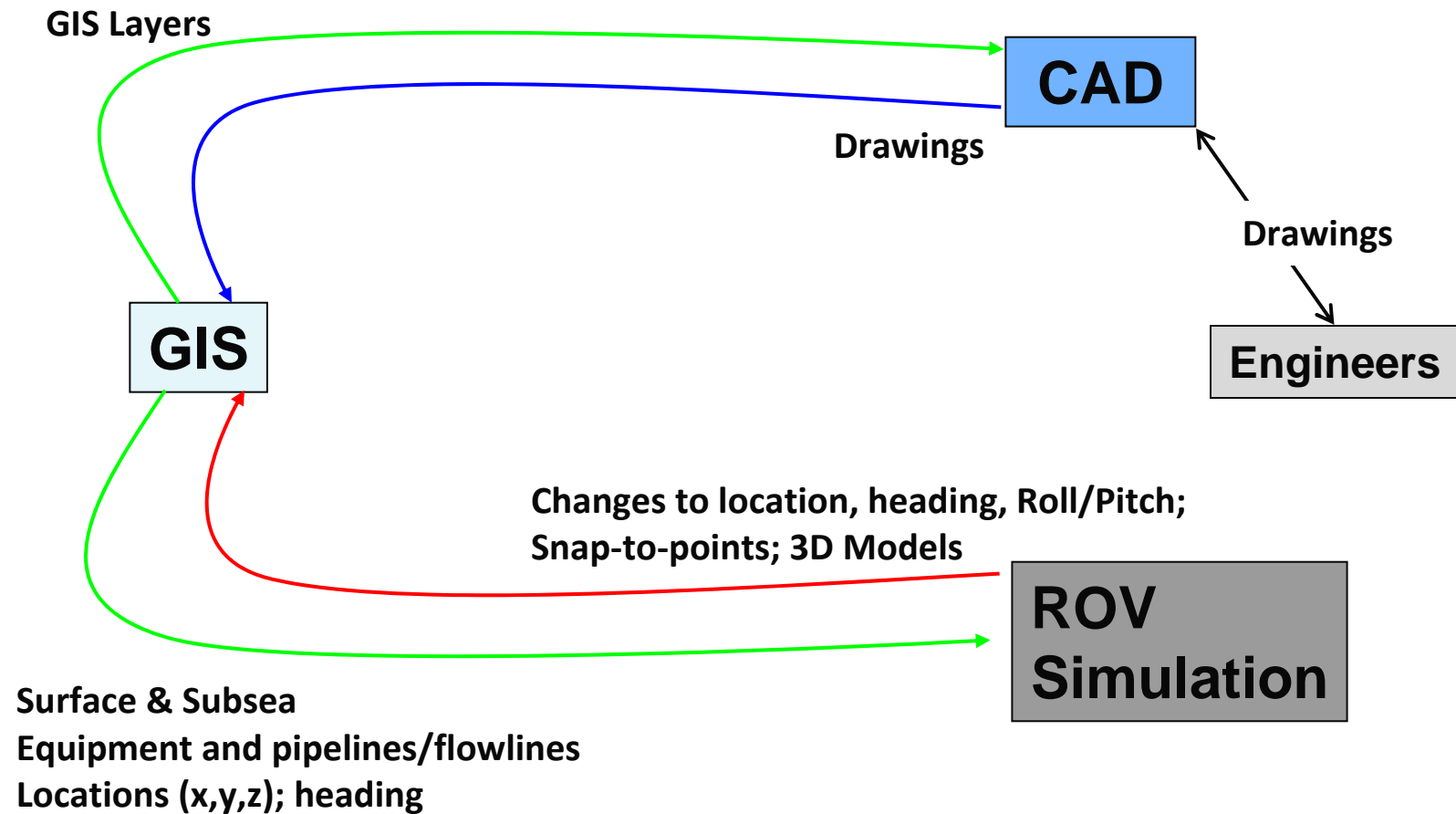
| Loc_From | Loc_To | Mfgr                      | Eqpt_Det  | Const_Mat | Ctrl_Oprtn                        |
|----------|--------|---------------------------|---|-----------|-----------------------------------|
| NA       | NA     | Subsea Equipment Supplier | Dual Header, Vertical Connections, Pigging Loop | CRA/Clad  | Electro-Hydraulic Multiphased SCM |
| NA       | NA     | Subsea Equipment Supplier | Manufacture Wellhead Type                       | CS/Inlaid |                                   |
| NA       | NA     | Subsea Equipment Supplier | Manufacture Wellhead Type                       | CS/Inlaid |                                   |
| NA       | NA     | Subsea Equipment Supplier | Manufacture Wellhead Type                       | CS/Inlaid |                                   |

Attributes of Equipment

| Pressure       | Insulatin | Prod_Svc      | Size         | Weight     | Inst_Date   | Elevation | Ref_ID_Num |   |   |       |
|----------------|-----------|---------------|--------------|------------|-------------|-----------|------------|---|---|-------|
| 10K MVP        | None      | Sweet Service | 10" x 10"    | 0          | 1/1/1901    | Manifold  | NA         |   |   |       |
| 10K MVP        |           | Sweet Service | 30" x 10.34" |            | 1/1/1901    |           | NA         |   |   |       |
| 10K MVP        |           | Sweet Service | 30" x 18.34" |            | 1/1/1901    |           | NA         |   |   |       |
| 10K MVP        |           | Sweet Service | 30" x 10.34" |            | 1/1/1901    |           | NA         |   |   |       |
| 10K MVP        |           | Sweet Service | 30"          |            |             |           |            |   |   |       |
| 10K MVP        |           | Sweet Service | 30"          |            |             |           |            |   |   |       |
| 10K MVP        |           | Sweet Service | 30"          |            |             |           |            |   |   |       |
| 10K MVP        |           | Sweet Service | 30"          |            |             |           |            |   |   |       |
| 10K WHSP       | None      | Sweet Service | 6"           | 625524.06  | 9956051.13  | -1705.0   | -1000      | 0 | 0 | 350   |
| 10K WHSP       | None      | Sweet Service | 6"           | 625525.335 | 9956815.001 | -1784     | -1000      | 0 | 0 | 0     |
| 10K WHSP       | None      | Sweet Service | 6"           | 625507.696 | 9956030.067 | -1705     | -1000      | 0 | 0 | 0     |
| 10K WHSP       | None      | Sweet Service | 6"           | 625542.316 | 9956830.399 | -1787     | -1000      | 0 | 0 | 0     |
| 10K WHSP       | None      | Sweet Service | 6"           | 625506.002 | 9956871.061 | -1786     | -1000      | 0 | 0 | 0     |
| 10K WHSP       | None      | Sweet Service | 6"           | 625540.401 | 9956072.770 | -1706     | -1000      | 0 | 0 | 0     |
| LP= 3K HP= 10K | NA        | NA            | Le           | 625522.445 | 9956887.125 | -1784     | -1000      | 0 | 0 | 0     |
| LP= 3K HP= 10K | NA        | NA            | Le           | 625526     | 9956015     | -1704     | -1000      | 0 | 0 | 359.7 |
|                |           |               |              | 625543     | 9956831     | -1785     | -1000      | 0 | 0 | 317.8 |
|                |           |               |              | 625540     | 9956873     | -1787     | -1000      | 0 | 0 | 220   |
|                |           |               |              | 625508     | 9956871     | -1786     | -1000      | 0 | 0 | 135.3 |
|                |           |               |              | 625522     | 9956887     | -1786     | -1000      | 0 | 0 | 177.2 |
|                |           |               |              | 625500     | 9956030     | -1704     | -1000      | 0 | 0 | 42.5  |
|                |           |               |              | 625538.54  | 9956888.29  | -1784     | -1000      | 0 | 0 | 0     |
|                |           |               |              | 625553.91  | 9956017.90  | -1704     | -1000      | 0 | 0 | 0     |

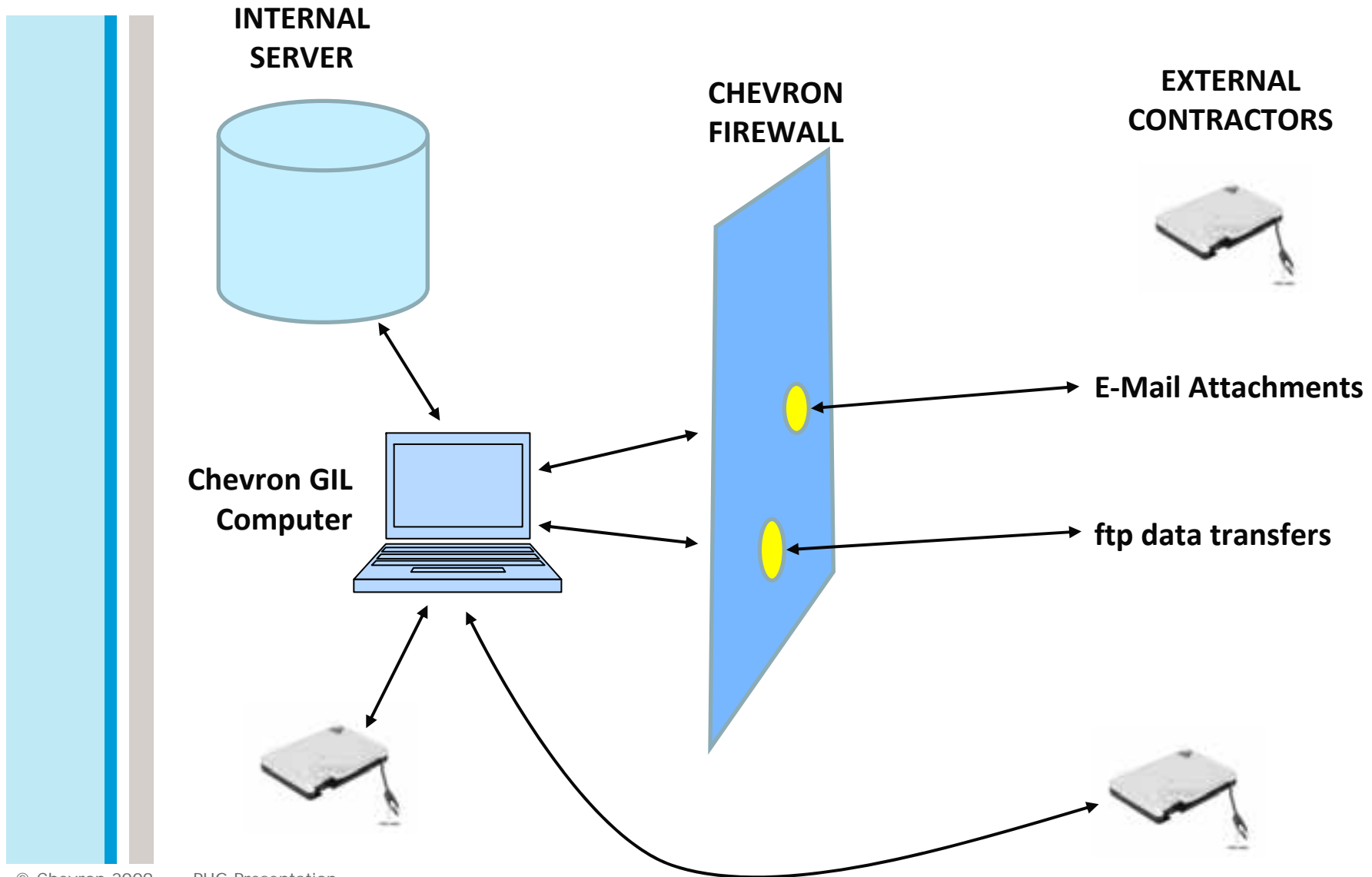
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## Data Exchange & Update



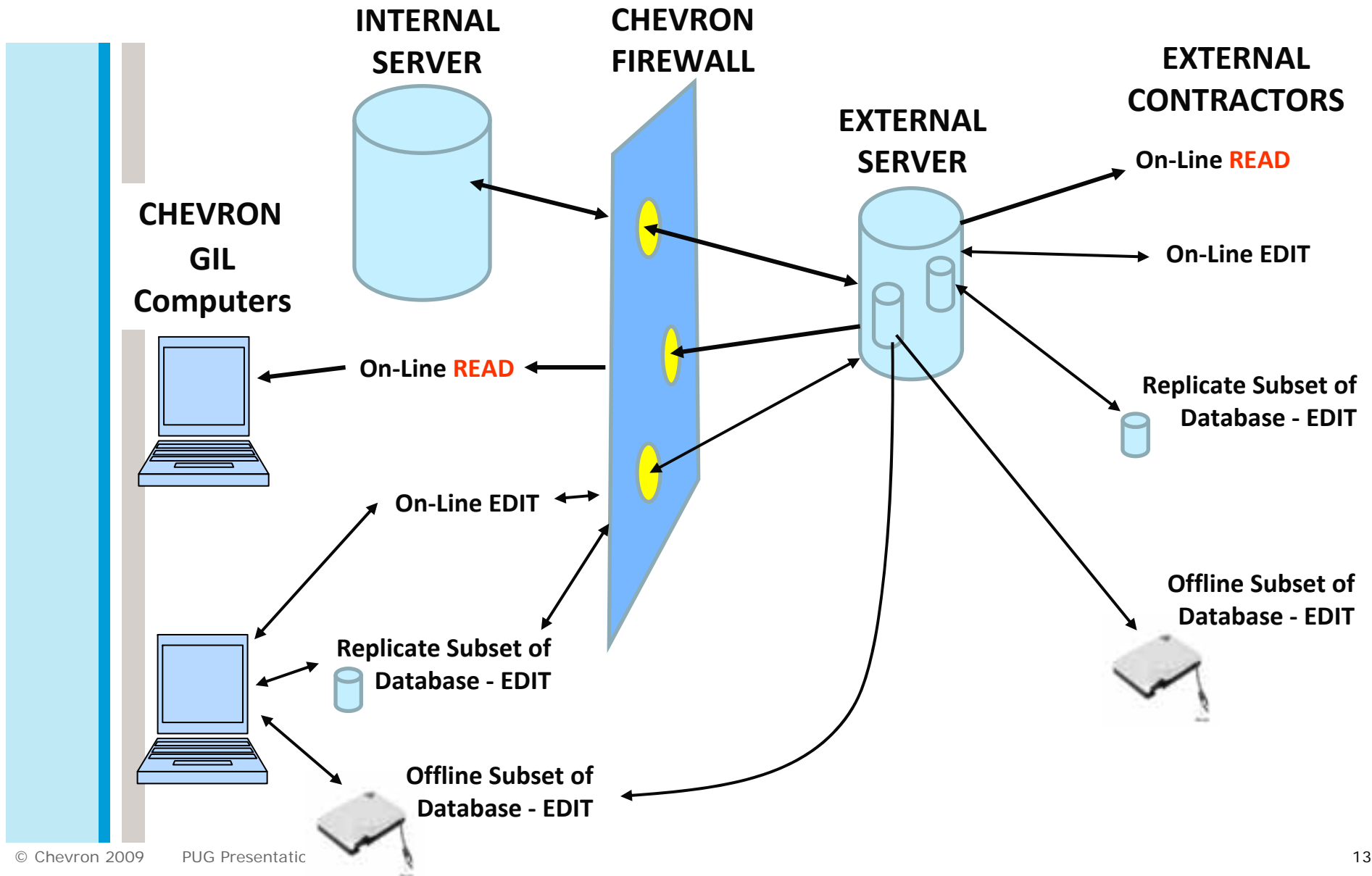
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## Prototype GIS Access & Distribution



# ArcGIS & 3D Simulation Life of Field Planning Tool

## Access & Distribution via Web-Based GIS

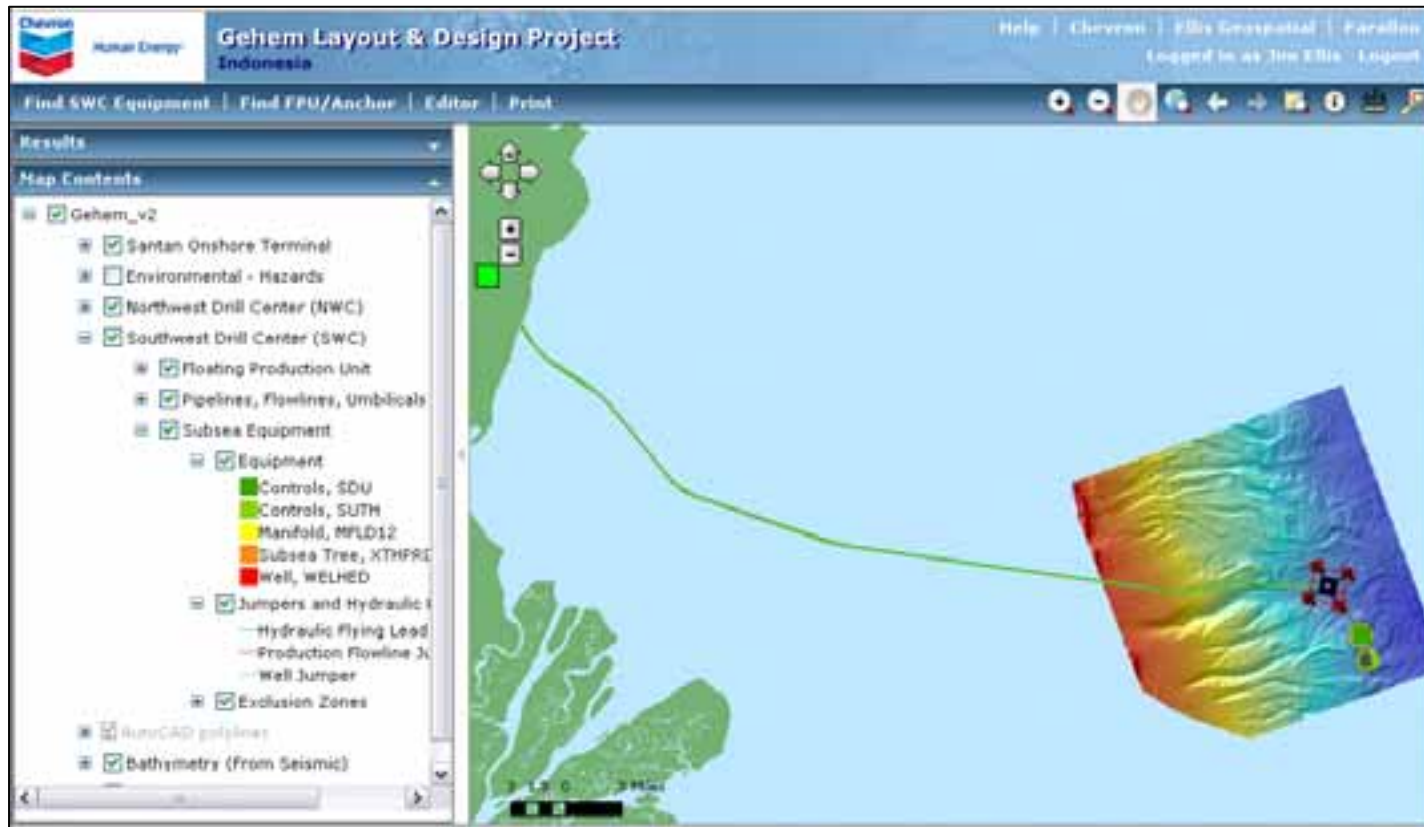


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### Access & Distribution via Web-Based GIS

- Converted prototype shapefile database to geodatabase
- Used ArcGIS Server 9.3 Advanced Enterprise software with ArcSDE technology
- Microsoft's SQL Server 2005 database (RDBMS)





# ArcGIS & 3D Simulation Life of Field Planning Tool



A Special Thanks To The Team Members That Made This Possible

|                    |                                   |
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**Questions?**

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