

Digging Deeper with 3D RaVE:

Visualizing and Managing
Impacted Excess Soils Using
Three-Dimensional, Rapid,
Volume Estimation Technology

Brant Gill and Anna Best

RemTech East - June 2, 2022



Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

Matrix 3D RaVE Team

J. Brant Gill, P.Geo. QP_{ESA}
Senior Hydrogeologist, Technical Advisor



Anna Best, P.Geo.
Hydrogeologist



Matrix Team Resources

Dave Van Vliet

Darron Abbey

Kam Chan

Jacky So

Scott Miller

Dustin Martin

Justine Chin-Cheong

Cassia Dal Bello

Eric Drost

Alex Piatek

Shayne Batters

Peter Bishop

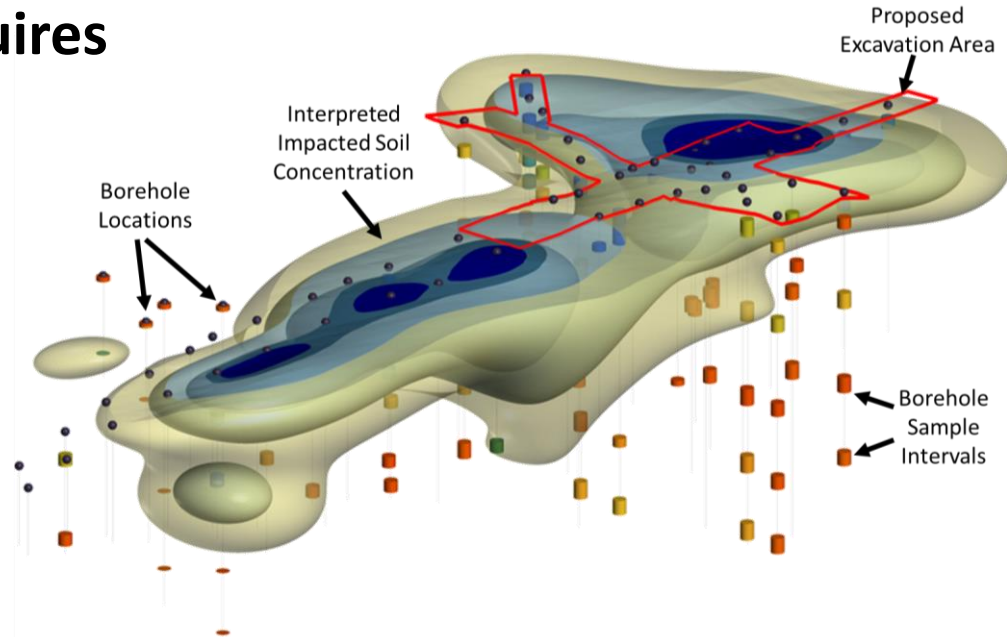


3D RaVE – The Matrix Solution

3D RaVE – Development

Effective site remediation requires

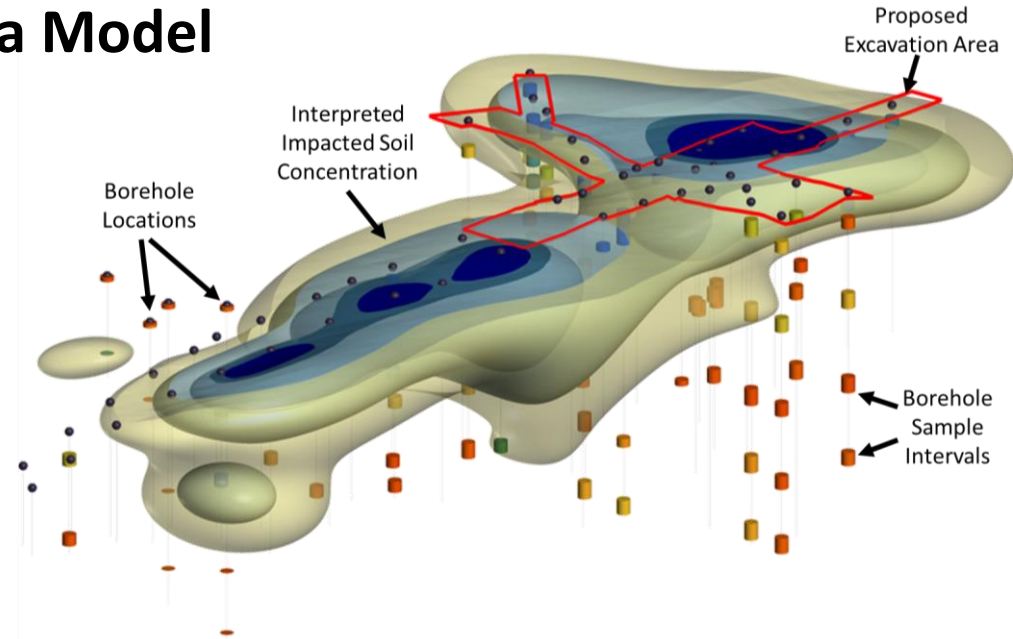
- Comprehensive understanding of site conditions
- Soil quality characterization
- Regulatory knowledge
- Technical experience of project team



3D RaVE – The Matrix Solution

Interactive Environmental Data Model

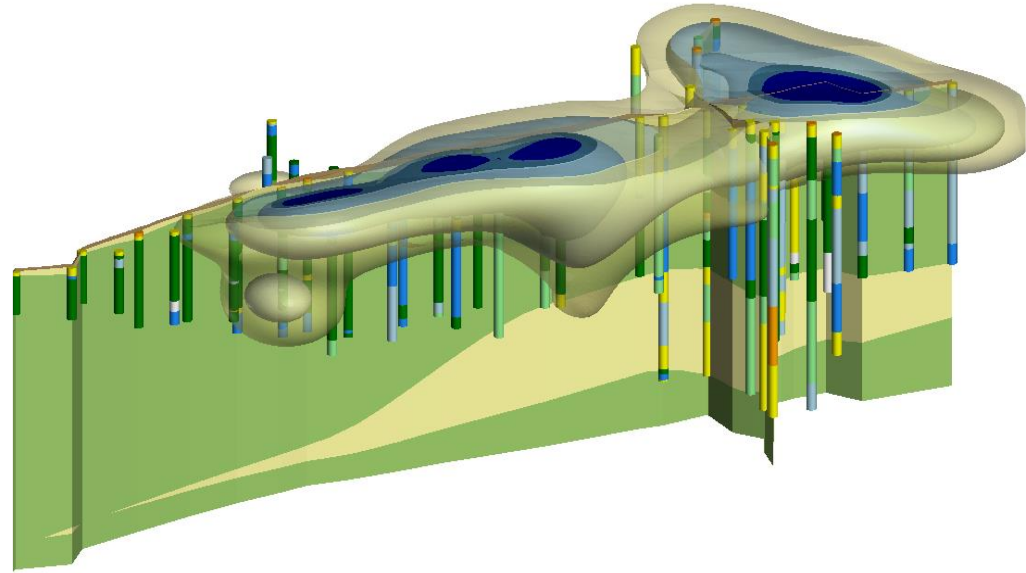
3D RaVE
3-Dimensional
Rapid
Volume
Estimation



3D RaVE – The Matrix Solution

3D Conceptual Site Model

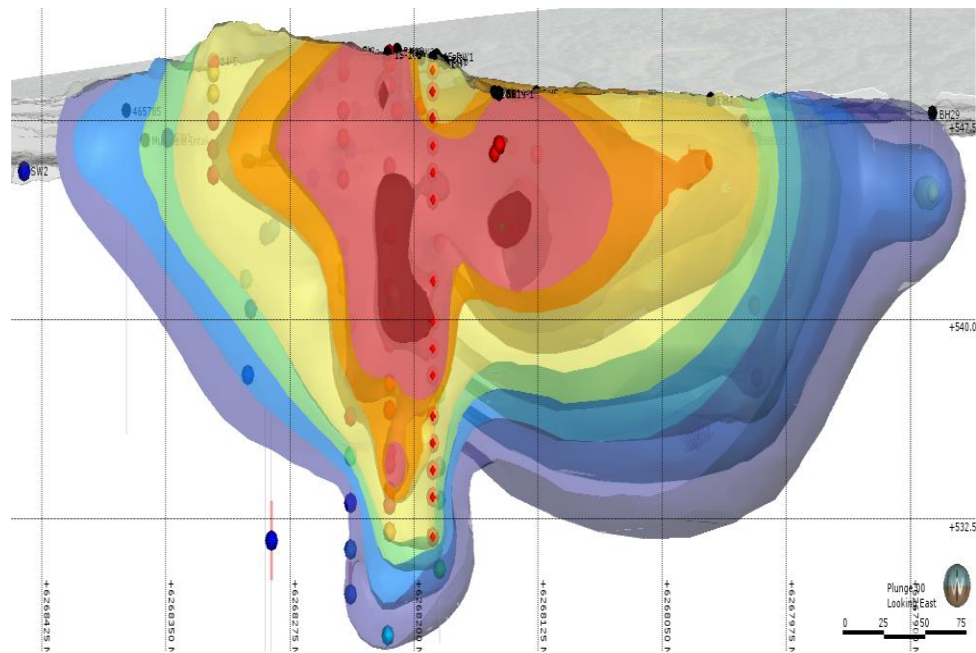
- Import BH log data
- Visualize soil quality data
- Identify data gaps
- Support soil and groundwater management and remediation



3D RaVE – The Matrix Solution

Using latest in advanced 3D modelling

- Leapfrog, Civil 3D
- Developed from contaminant plume modelling
- Excess Soil Management Regulation (O.Reg. 406/19)
- Site remediation
- Aggregate resource assessment



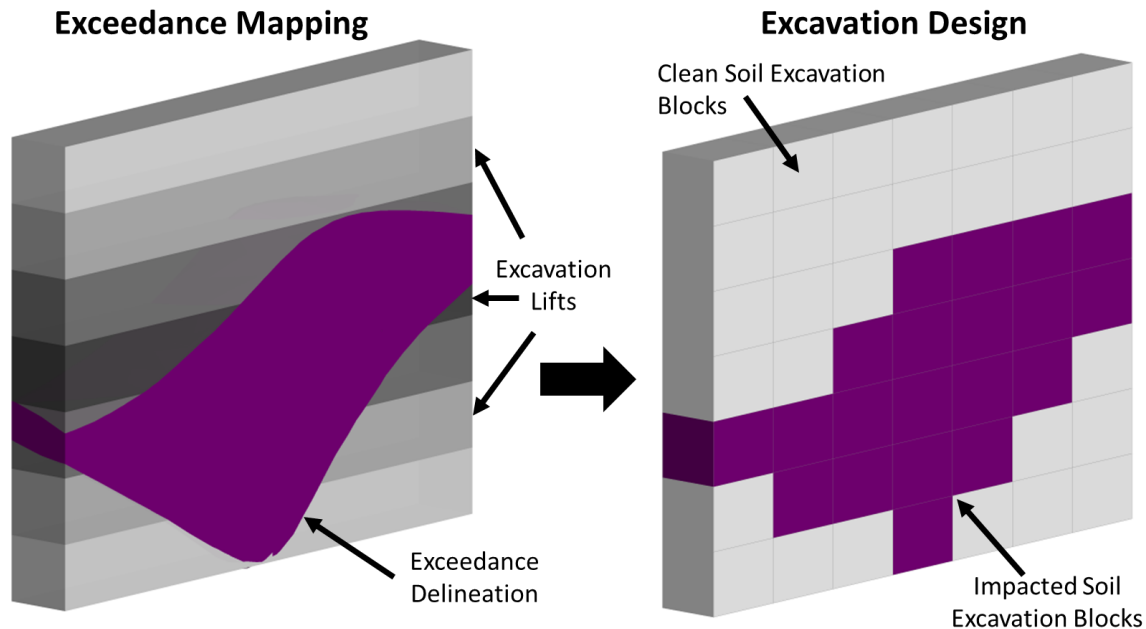
3D RaVE – Excavation Applications

Convert Site Soil Quality Data

From Lab Results to:

- 3D Model
- Contaminant Delineation
- Exceedance Mapping
- Excavation Design

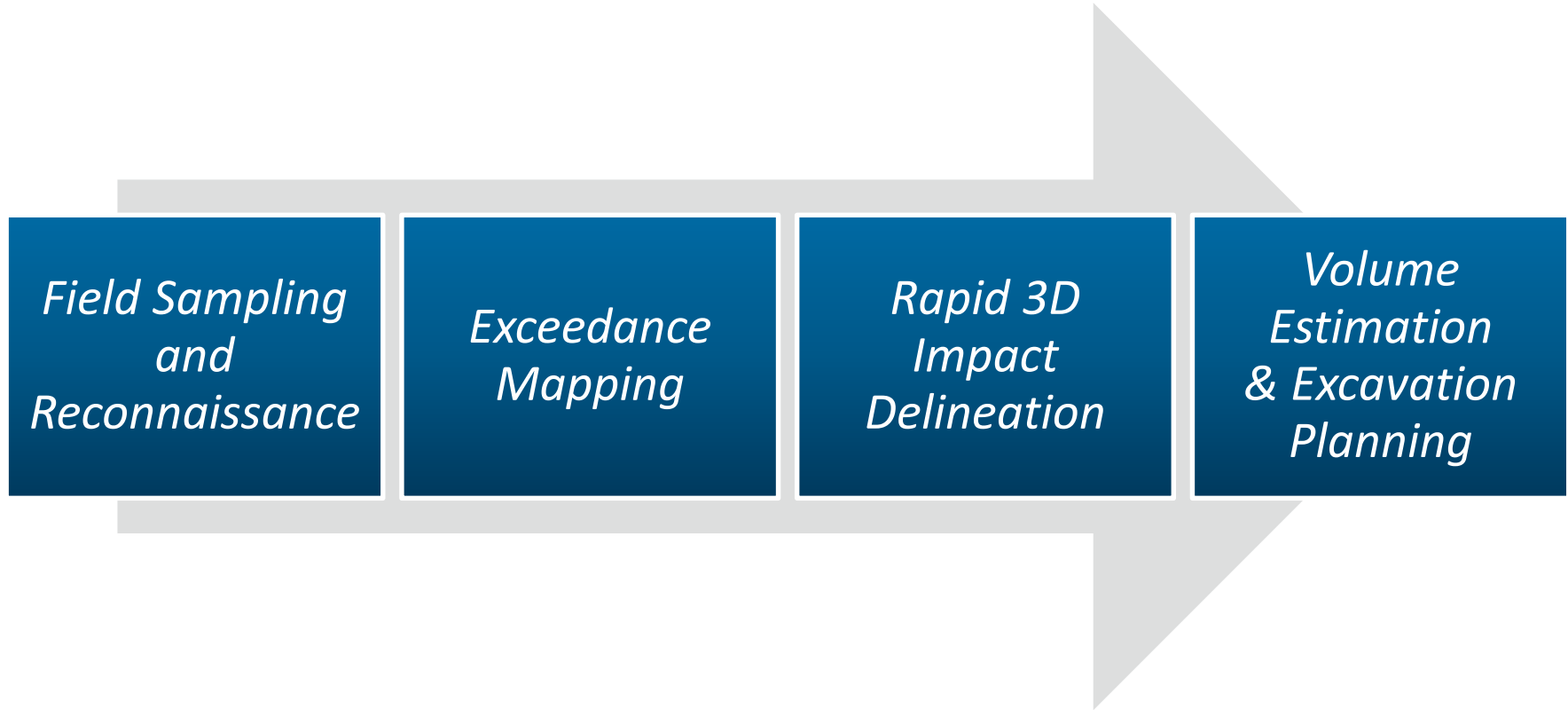
Results in Efficient Excavation
And Soil Management





3D RaVE – Workflow

3D RaVE Tool Workflow

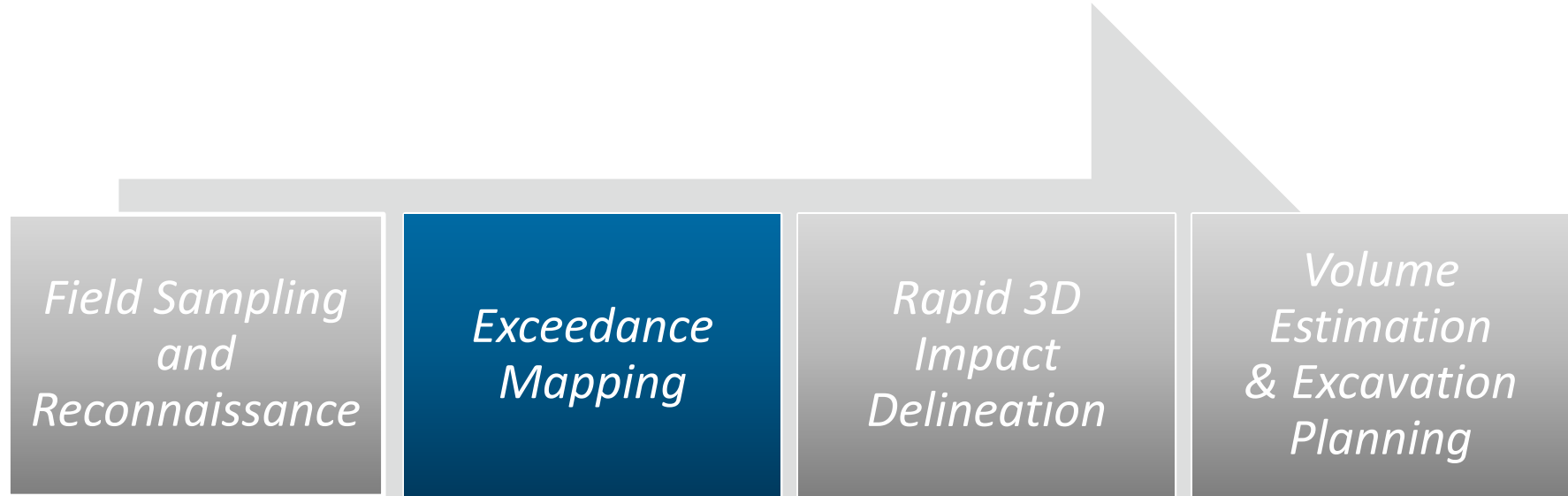


3D RaVE Tool Workflow



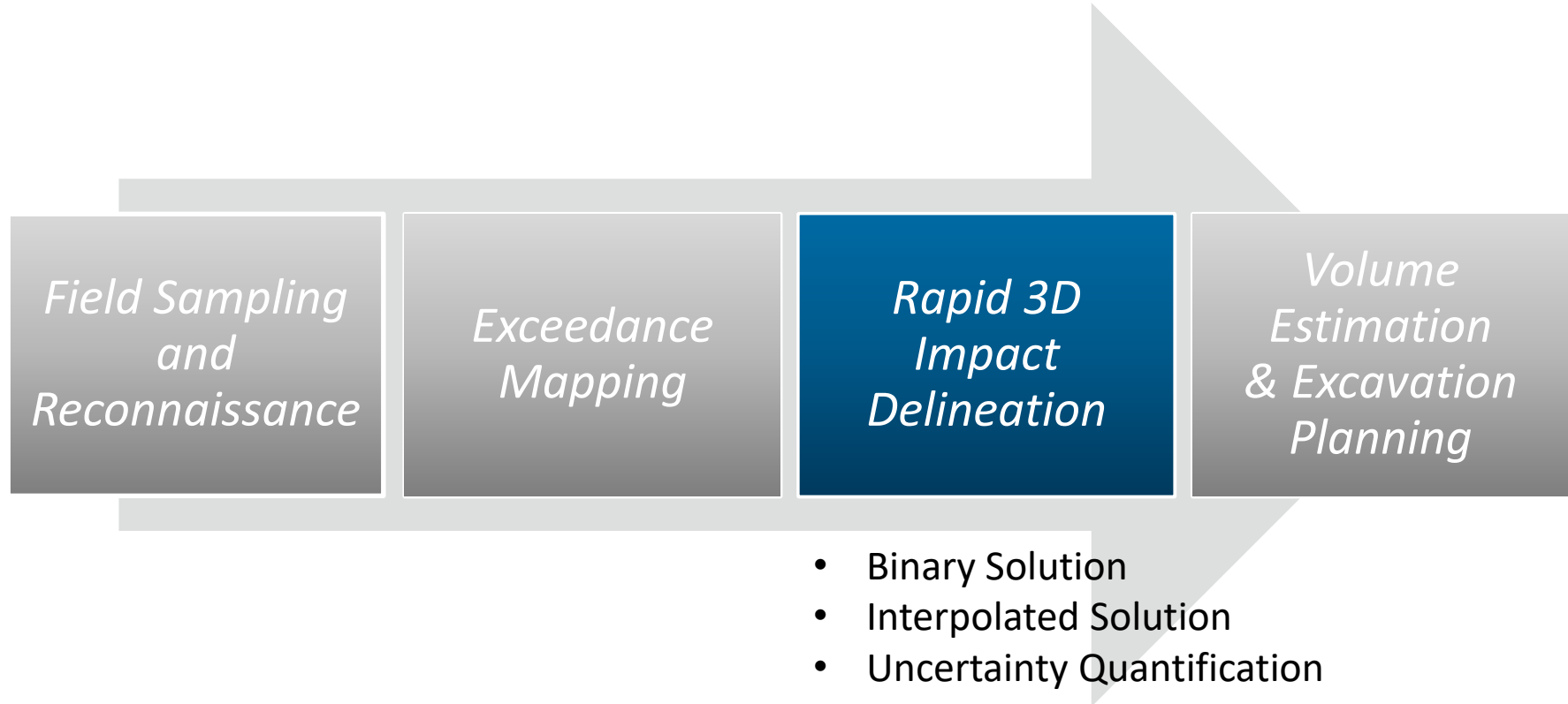
- Lab Data Acquired by Matrix, Client, or 3rd Party
- Digital Database
- Sample XYZ Coordinates
- DEM Correction

3D RaVE Tool Workflow



- Any Suite of Analytes
- Any MECP Site Condition Standards
- CCME Guidelines
- Project Tailored

3D RaVE Tool Workflow



3D RaVE Tool Workflow

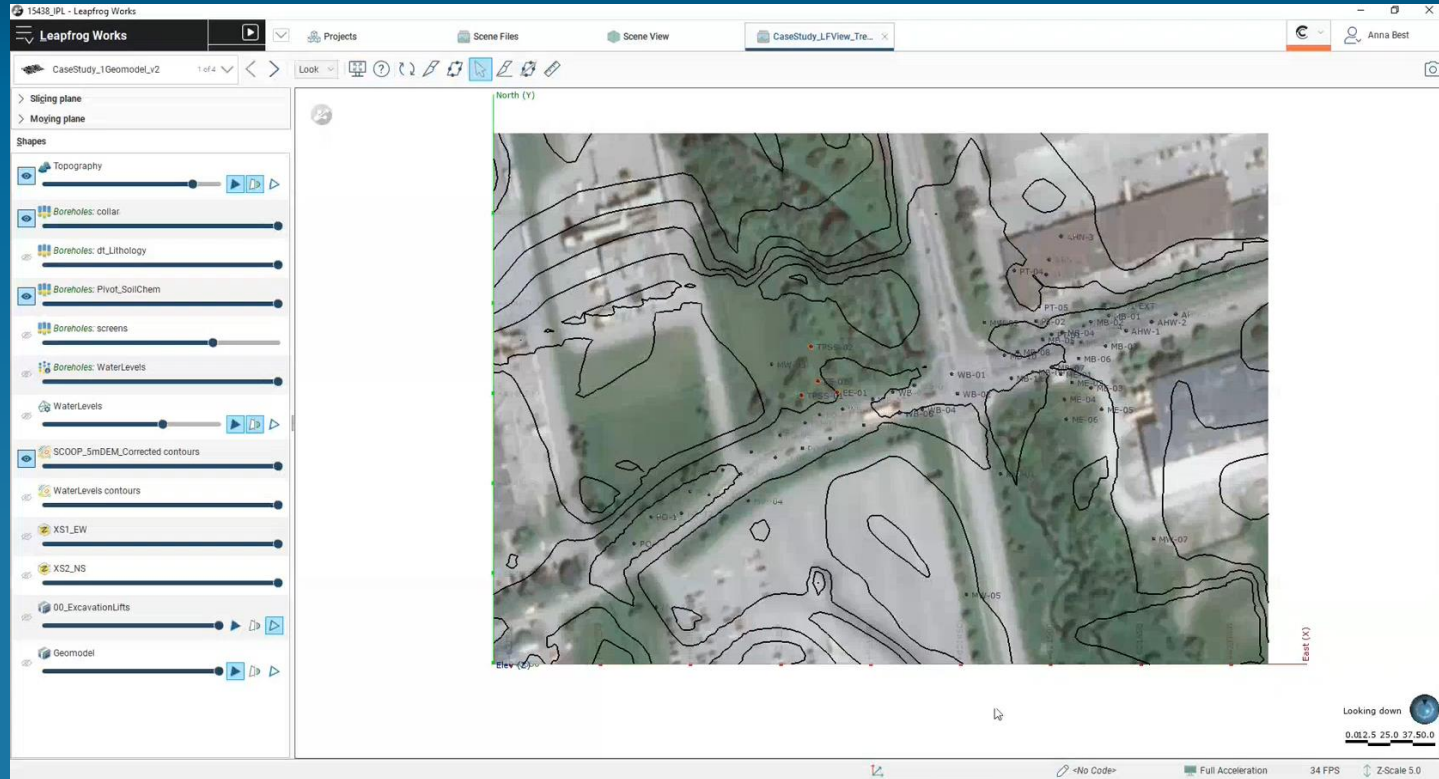


- Impacted Soil Volume Estimates
- Remediation Options Analyses
- Cost-Benefit Analyses
- Excavation Design File

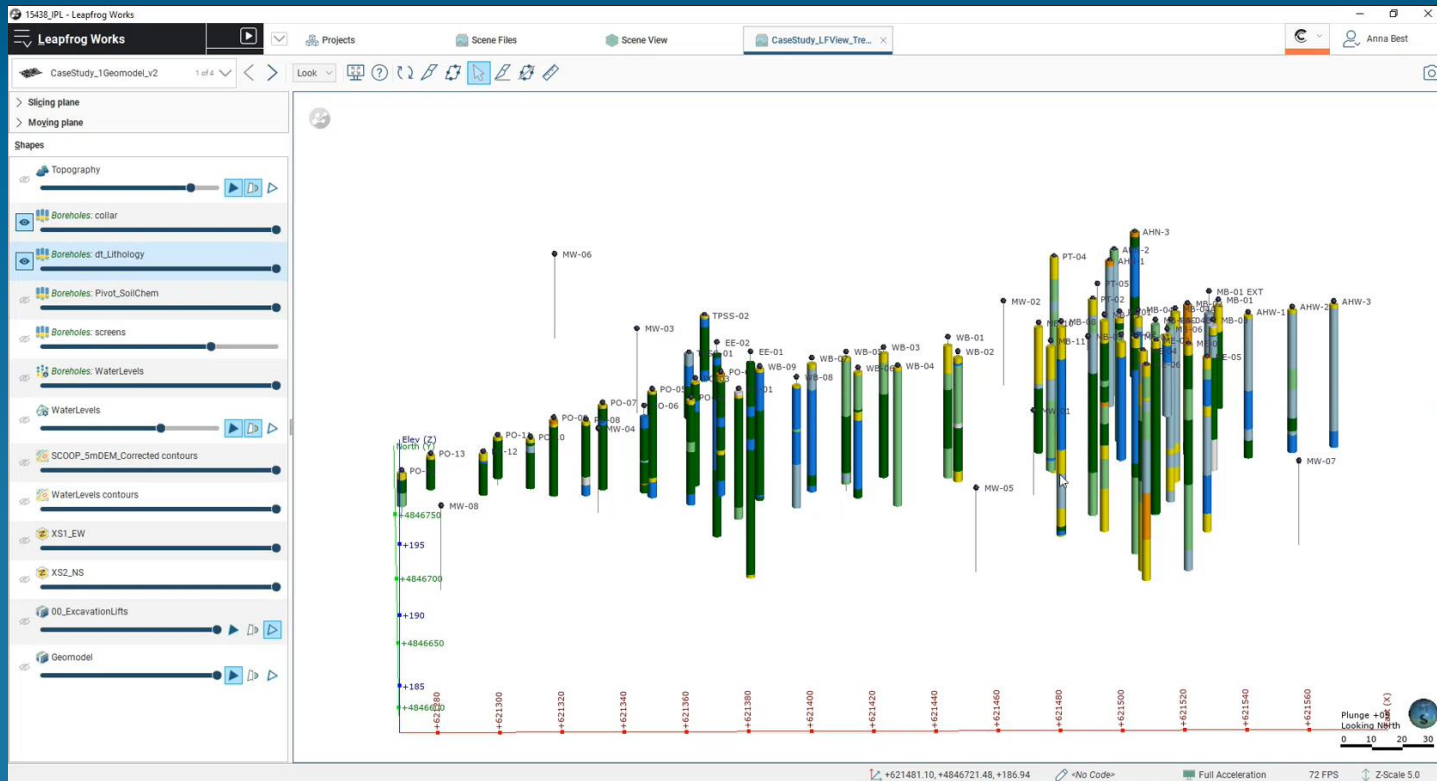


3D RaVE Tool – Interactive Visualization

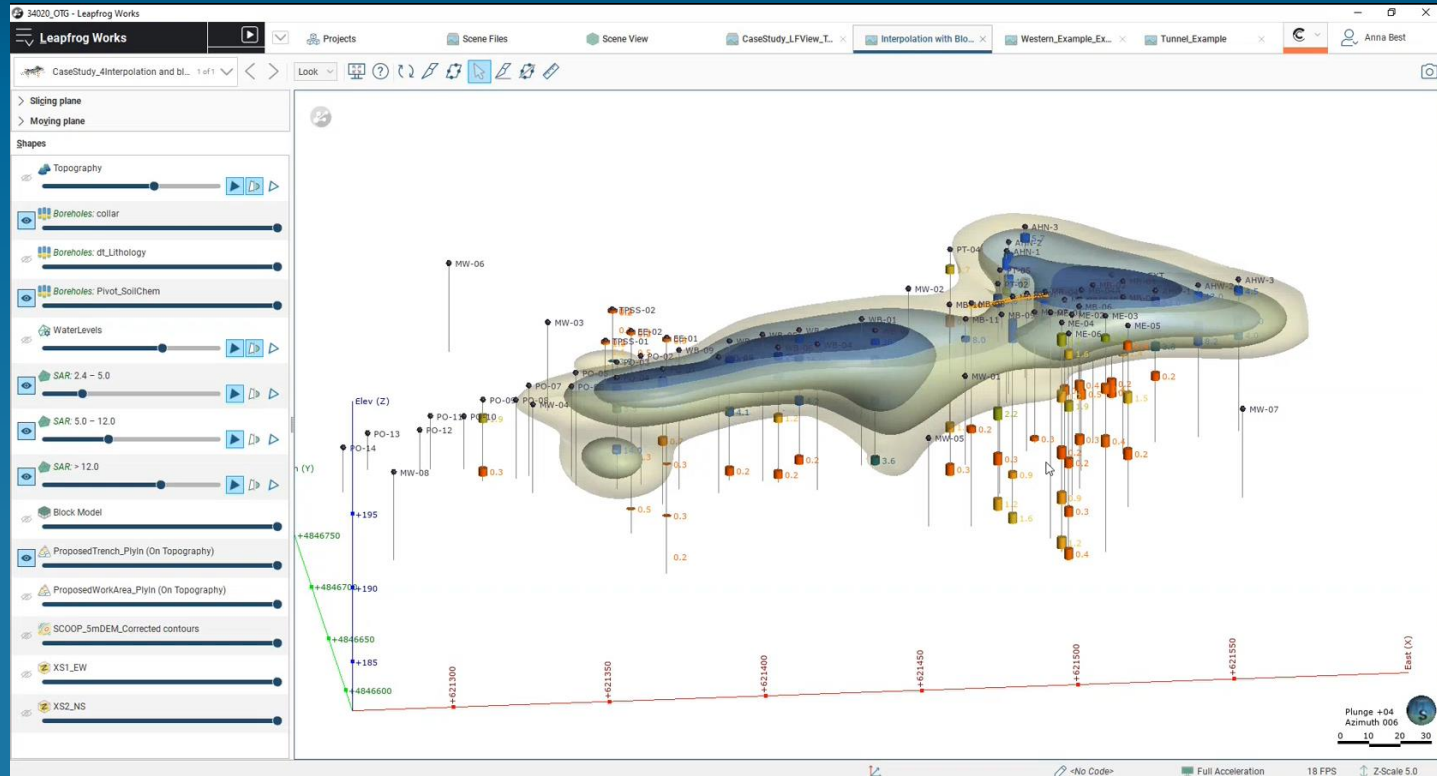
3D RaVE – Site Data in 3D



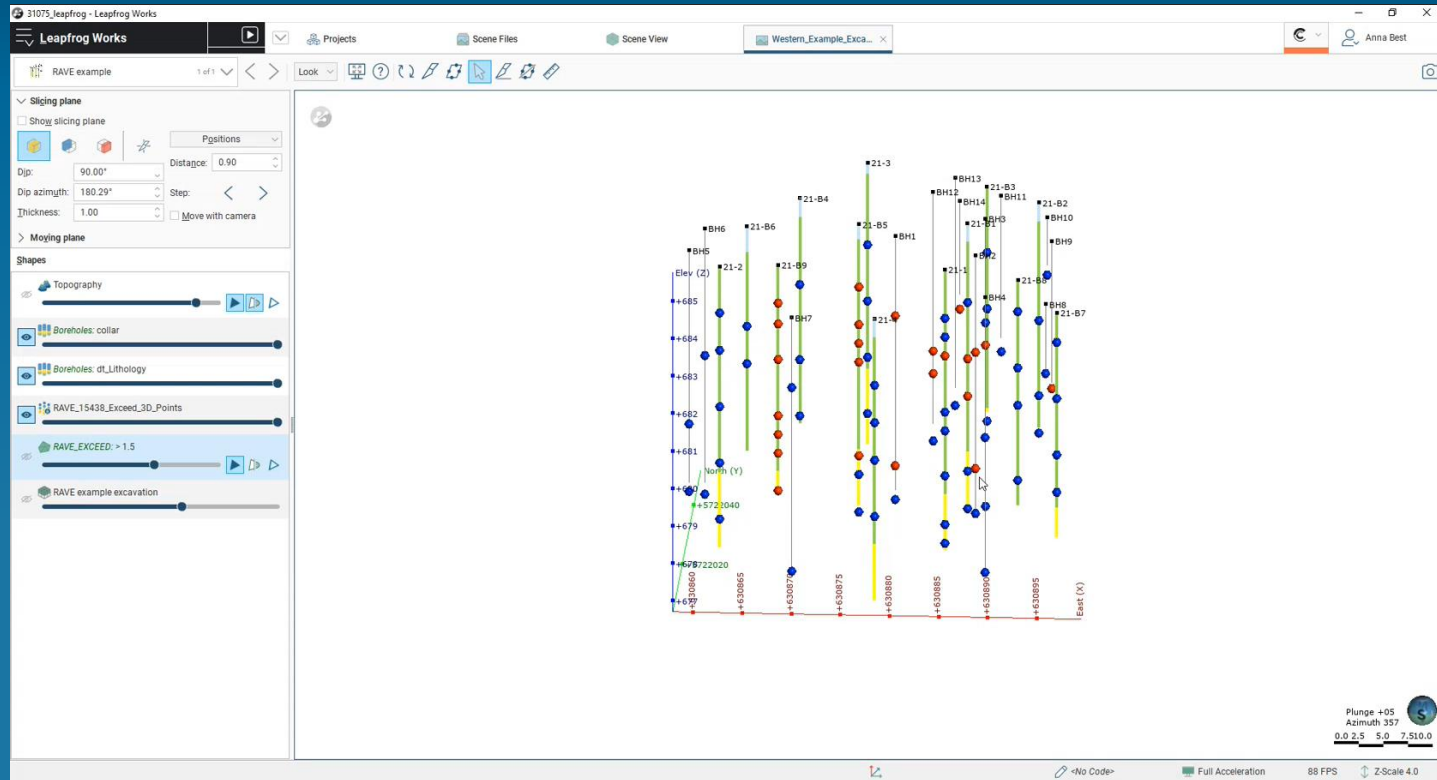
3D RaVE – Geologic Model



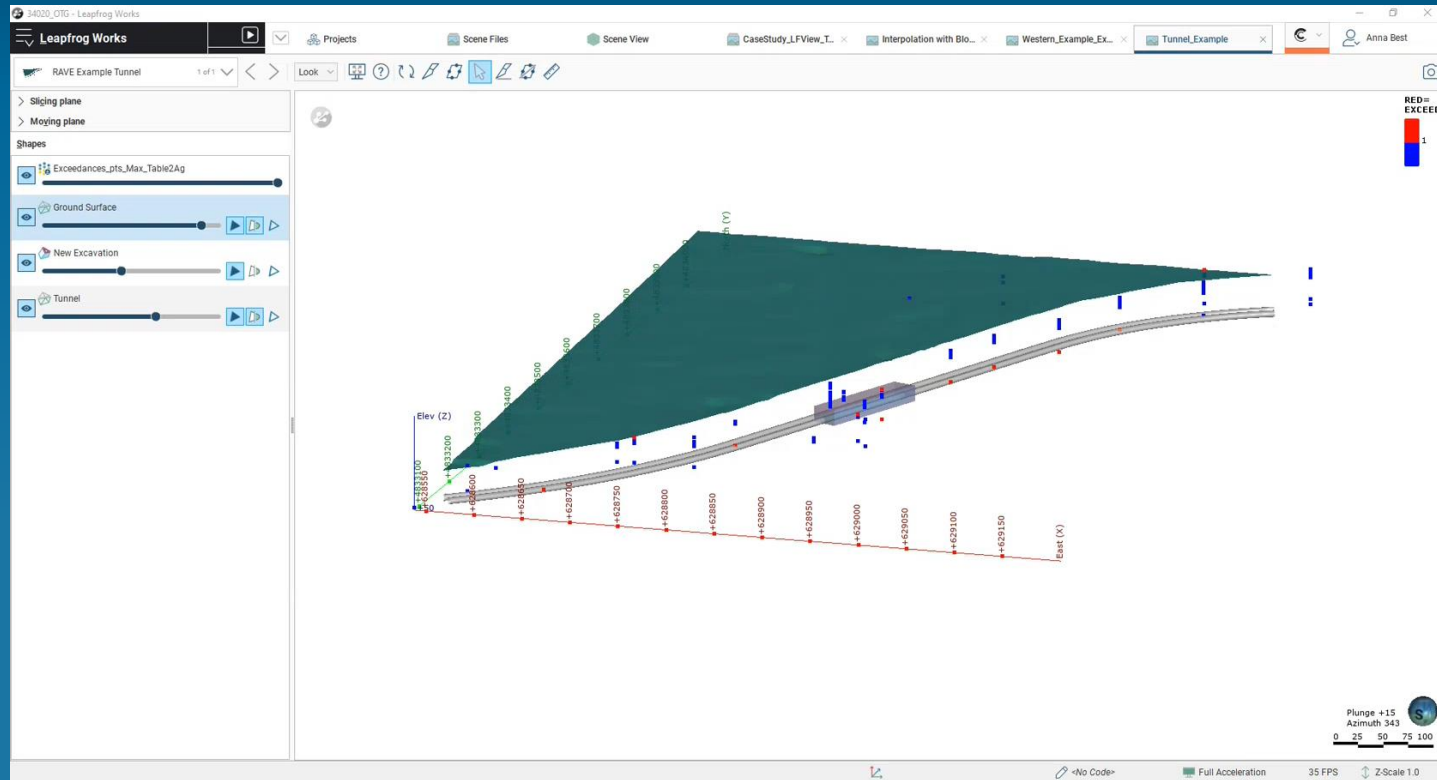
3D RaVE – Interpolation & Excavation



3D RaVE – Impact Delineation & Excavation



3D RaVE – Tunnel Excavation Planning



3D RaVE Summary

- **Advance Planning** can result in cost savings and improved risk management
- Understanding the **volume** and **quality** of soil to be managed is important to identifying strategic remediation and soil management options
- Improved **remediation technology options analyses**
- **3D Site Characterization** improves overall project planning and soil management
- From project initial to completion, **3D RaVE** is the solution to complex soil management and remediation

Matrix Team Resources

Matrix has over 60 staff across Ontario to help support your excess soil management needs.

From strategic planning and site characterization, to volume estimation, remediation, and construction oversight.

Contact Us

Primary Client Contacts:

J. Brant Gill, P.Geo., QP^{ESA}
Senior Hydrogeologist, Technical Advisor
T 289.323.3757

Jacky So, P.Eng., QP^{ESA}
Senior Environmental Engineer
T 289.323.0982

Kam Chan, P.Eng., QP^{ESA}
Sector Lead, Community Infrastructure
T 289.323.3785

Matrix Solutions Mississauga Office:

Suite 3001 – 6865 Century Ave
Mississauga, ON, Canada L5N 7K2
T 905.877.9531
www.matrix-solutions.com