

1 CLASS VI PERMIT APPLICATION NARRATIVE

40 CFR 146.82(a)

TULARE COUNTY CARBON STORAGE PROJECT (TCCSP)

Facility Information

Facility (site) Name: Tulare County Carbon Storage Project (TCCSP)

Facility Operator: TCCSP, LLC.

Facility Contact:



Project Location:



Injection Well Name and Coordinates:

Well Name	Latitude	Longitude
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

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List of Tables

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List of Figures

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List of Acronyms/Abbreviations

2D	2-Dimensional
3D	3-Dimensional
AoI	Area of Interest
AoR	Area of Review
bbl/d	Barrels per day
BHP	Bottom Hole Pressure
CCS	Carbon capture and storage
CO ₂	Carbon dioxide
CMG	Computer Modelling Group
D _H	Hydraulic Diameter
DRM	Dynamic Reservoir Model
EoS	Equation of State
EPA	Environmental Protection Agency
f _D	Darcy's Friction Factor
ft	feet
g	Acceleration due to Gravity
GEM	General Equation of State
KB	Kelly Bushing
k _{r,CO2}	CO ₂ Relative Permeability
kh	Permeability-Thickness Product
k _h	Absolute Horizontal Permeability
k _v	Absolute Vertical Permeability
k _{r,w}	Water Relative Permeability
mg/L	milligrams per liter
MIP	Mercury Intrusion Porosimetry
MIT	Mechanical Integrity Testing
MMt	Millions of Metric tons
MMtpa	Millions of Metric tons per annum
ΔP	Pressure Drop
ΔP _{TH}	Threshold Pressure
PISC	Post-Injection Site Care
P _{grid}	Grid Block Pressure
pH	Potential Hydrogen
ppm	Parts per Million
psi	Pounds per square inch
psia	Pounds per square inch, absolute
ρ	Fluid Density
ρ _i	Injection Zone Fluid Density
ρ _u	Underground Source for Drinking Water Fluid Density
RCA	Routine Core Analysis
Re	Reynolds Number
SCA	Specialized Core Analysis
SEM	Static Earth Model

S_{grmax}	Maximum Residual Gas Saturation
SS	Subsea
S_{wconn}	Connate Water Saturation
S_{wirr}	Irreducible Water Saturation
T_{grid}	Grid Block Temperature
TVD	True Vertical Depth
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water
U.S. DOE	United States Department of Energy
U.S. EPA	United States Environmental Protection Agency
v	Fluid Velocity
z_i	Injection Zone Top Depth
z_u	Underground Source for Drinking Water Bottom Depth

1.1 Project Background and Contact Information

GSDT Submission - Project Background and Contact Information

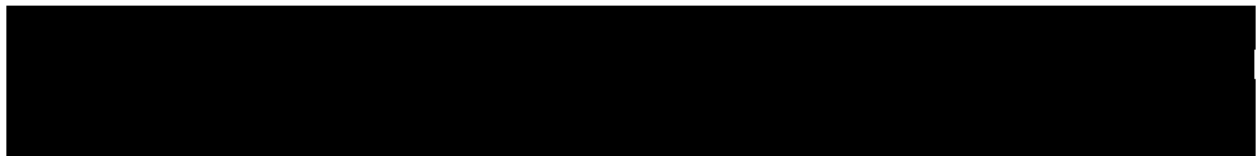
GSDT Module: Project Information Tracking

Tab(s): General Information tab; Facility Information and Owner/Operator Information tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Required project and facility details [40 CFR 146.82(a)(1)]

1.1.1 Project Background



[REDACTED]

1.1.2 Partners and Collaborators

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

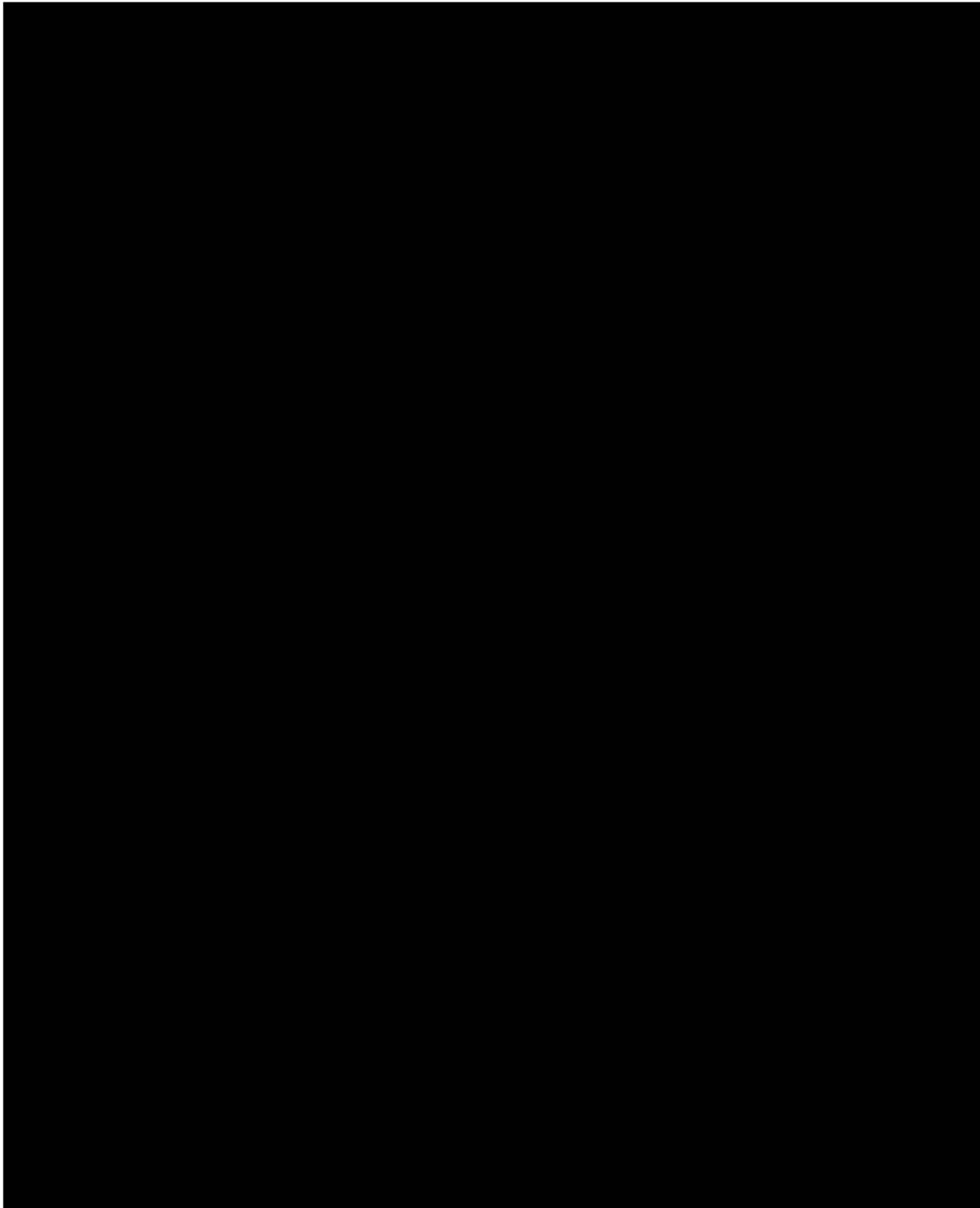
1.1.2.1 Tribal Contacts

[REDACTED]

[REDACTED]

1.1.3 Project Timeframe

[REDACTED]



1.1.4 Proposed Injection Mass and CO₂ Source

TCCSP, LLC. plans to inject 50 million metric tons (MMt) of CO₂ over 20 years at the TCCSP



1.1.5 Injection Depth Waiver

No injection depth waiver is currently sought in this application.

1.1.6 Aquifer Exemption

No aquifer exemption is currently sought in this application.

1.1.7 Applicable Permit Information Under 40 CFR 144.31(e)(1) through (6)



1.1.8 Contact Details for TCCSP, LLC.

Facility (site) Name: Tulare County Carbon Storage Project (TCCSP)

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1.1.8.1 Applicable SIC Codes

[REDACTED]

[REDACTED]

1.1.8.2 Other permit information required under 40 CFR 144.31(e)(6)

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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[REDACTED]

1.2 Site Characterization

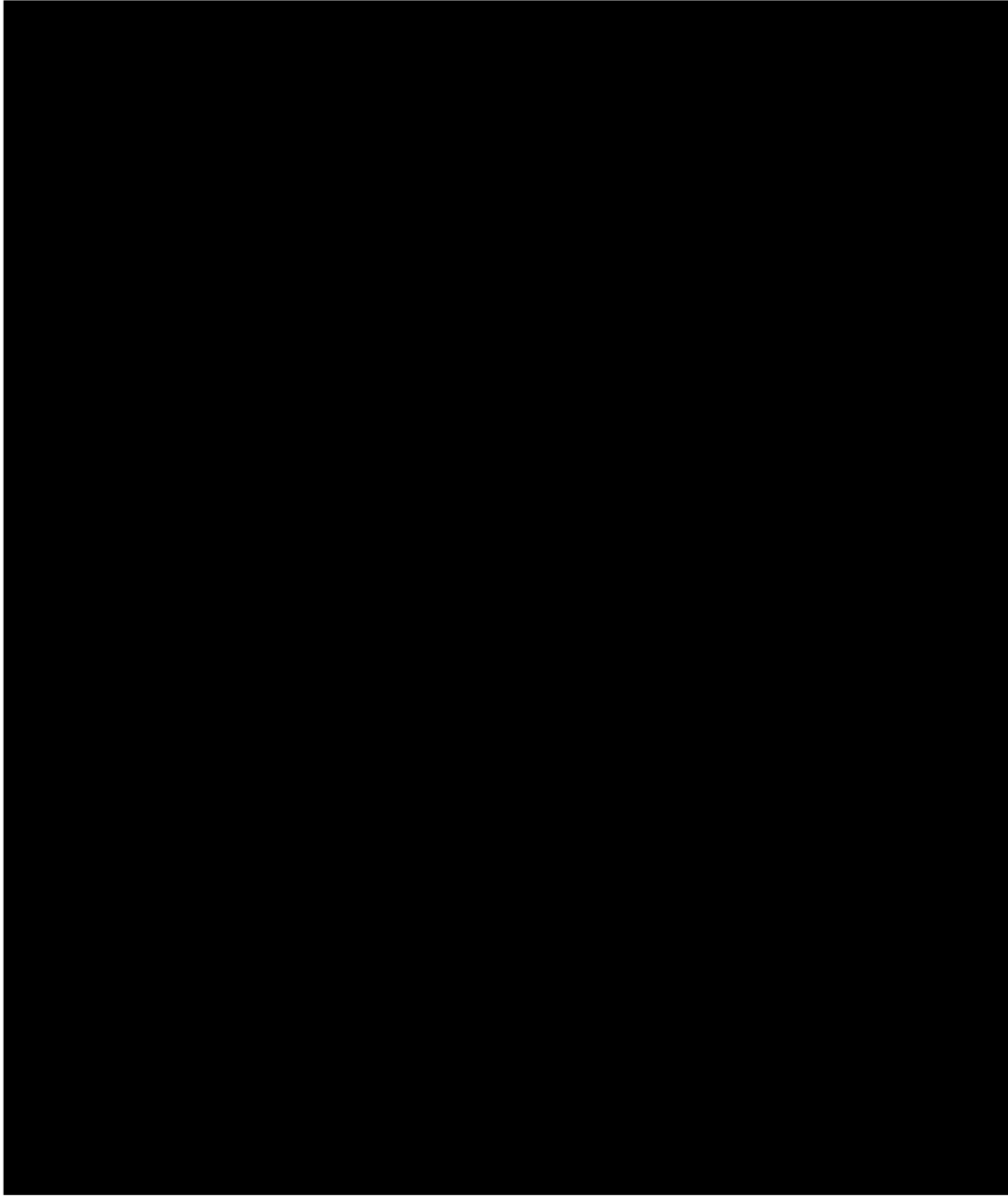
1.2.1 Regional Geology, Hydrogeology, and Local Structural Geology [40 CFR 146.82(a)(3)(vi)]

1.2.1.1 Regional Geologic Structures

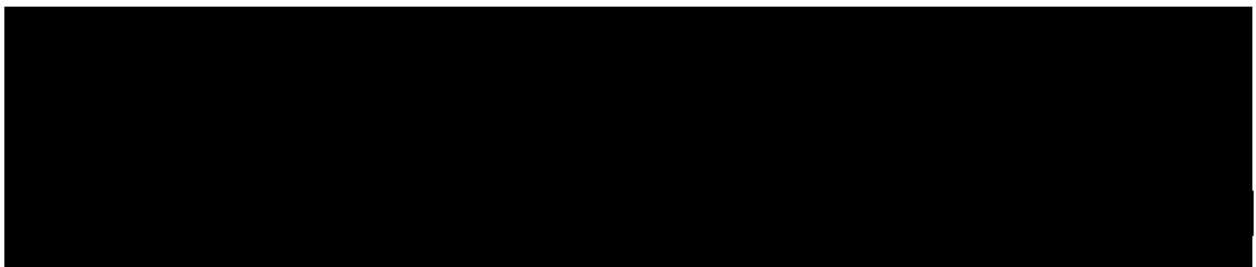
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1.2.1.2 Regional Stratigraphy and Stratigraphic Megasequences



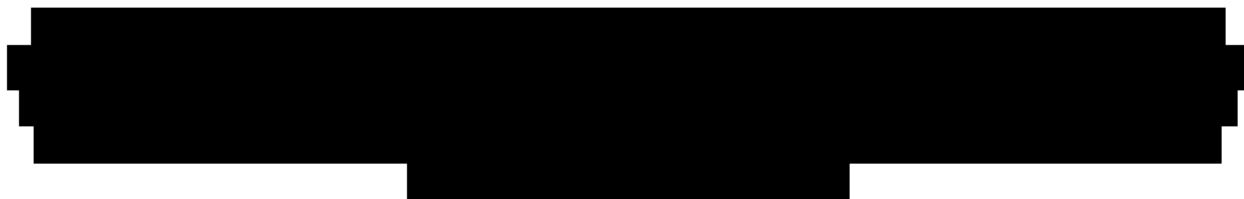
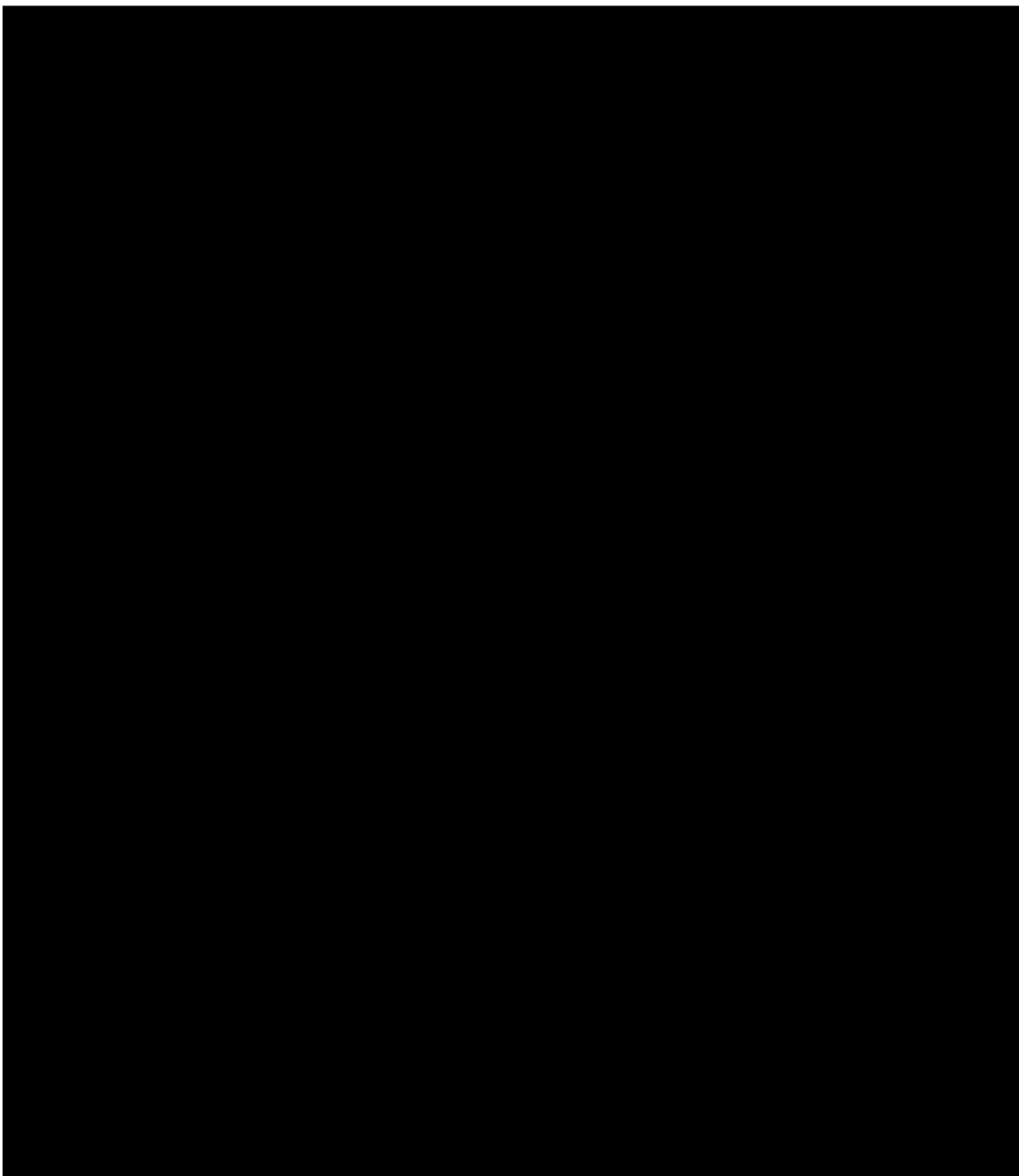
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1.2.1.3 Regional and Local Subsurface Stratigraphy

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out landward to the east and gradually thin to the west along distal positions. Lowstand Systems

[REDACTED]

[REDACTED]

[REDACTED]

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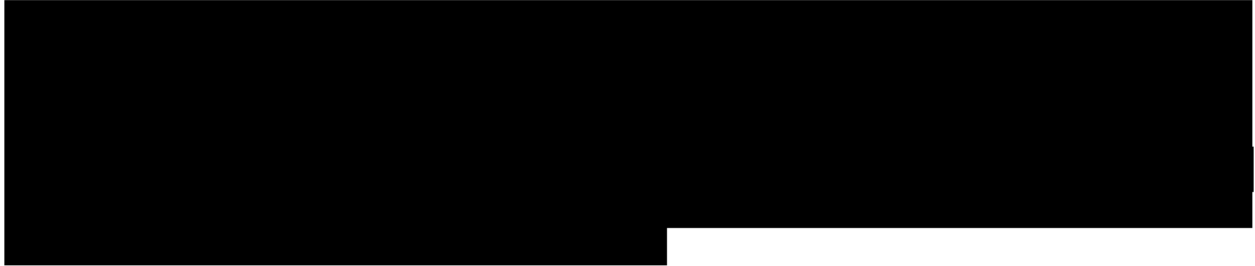
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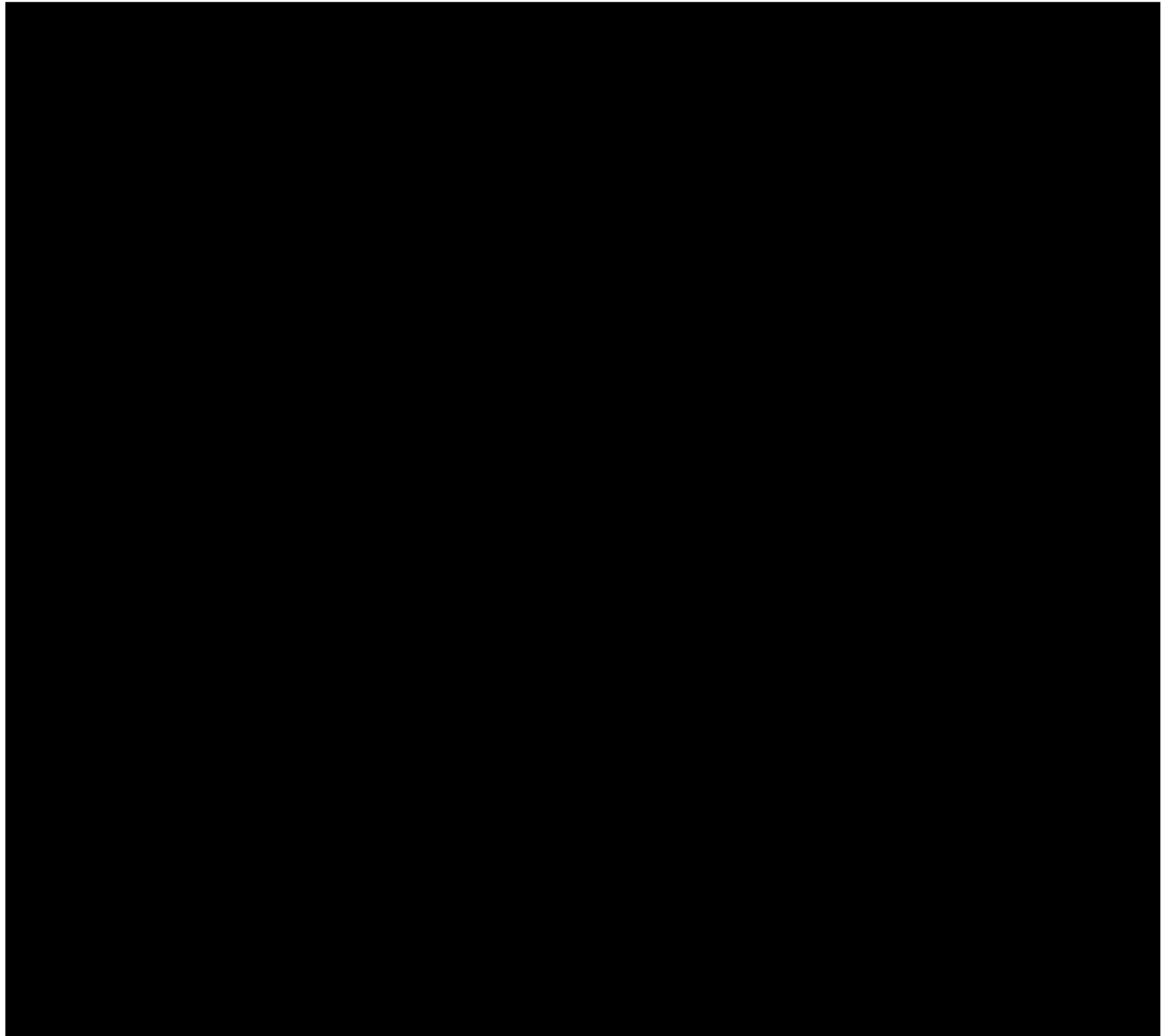
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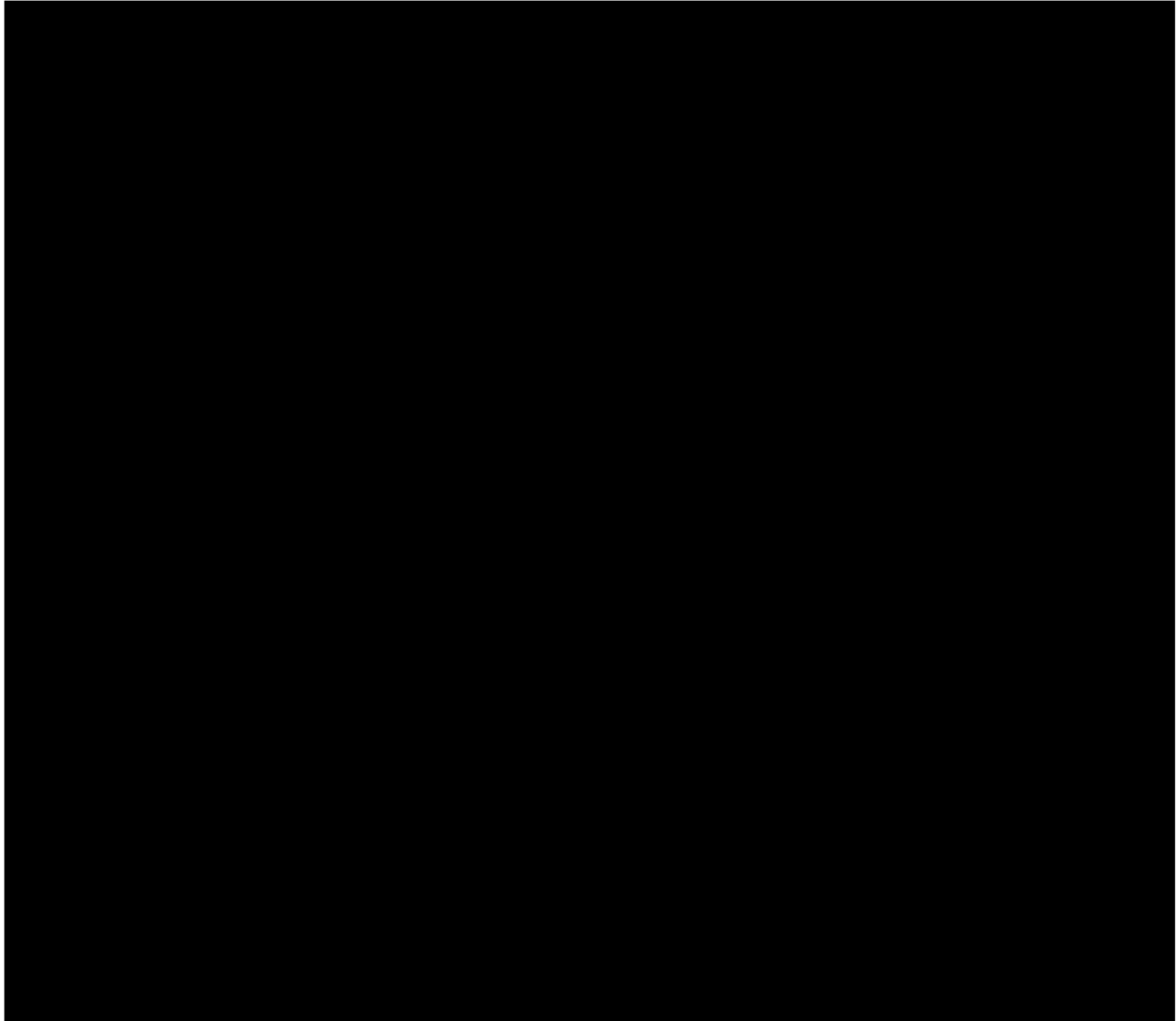
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1.2.3 Maps and Cross Sections of the AoR [40 CFR 146.82(a)(2), 146.82(a)(3)(i)]

Subsurface Database





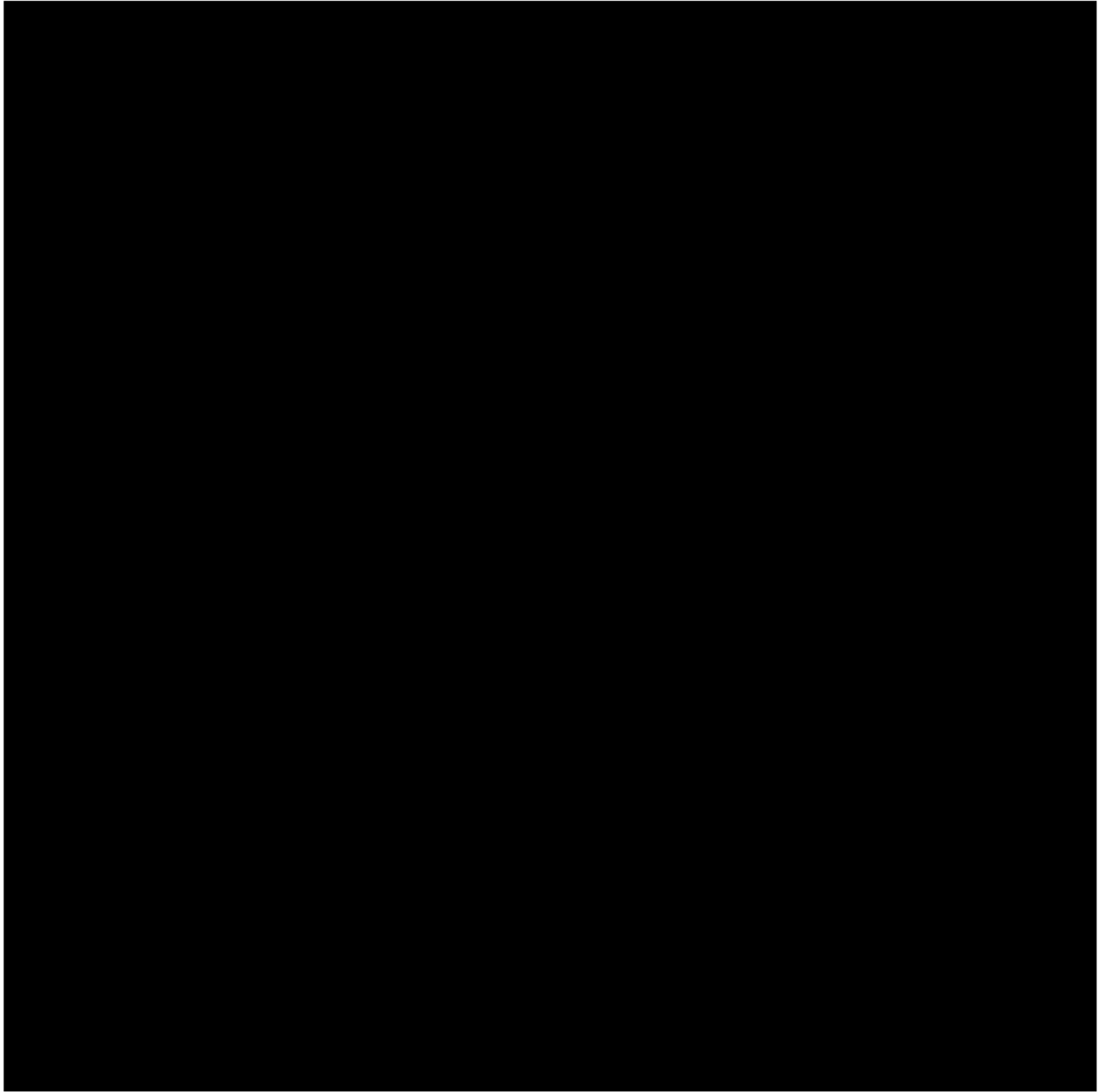


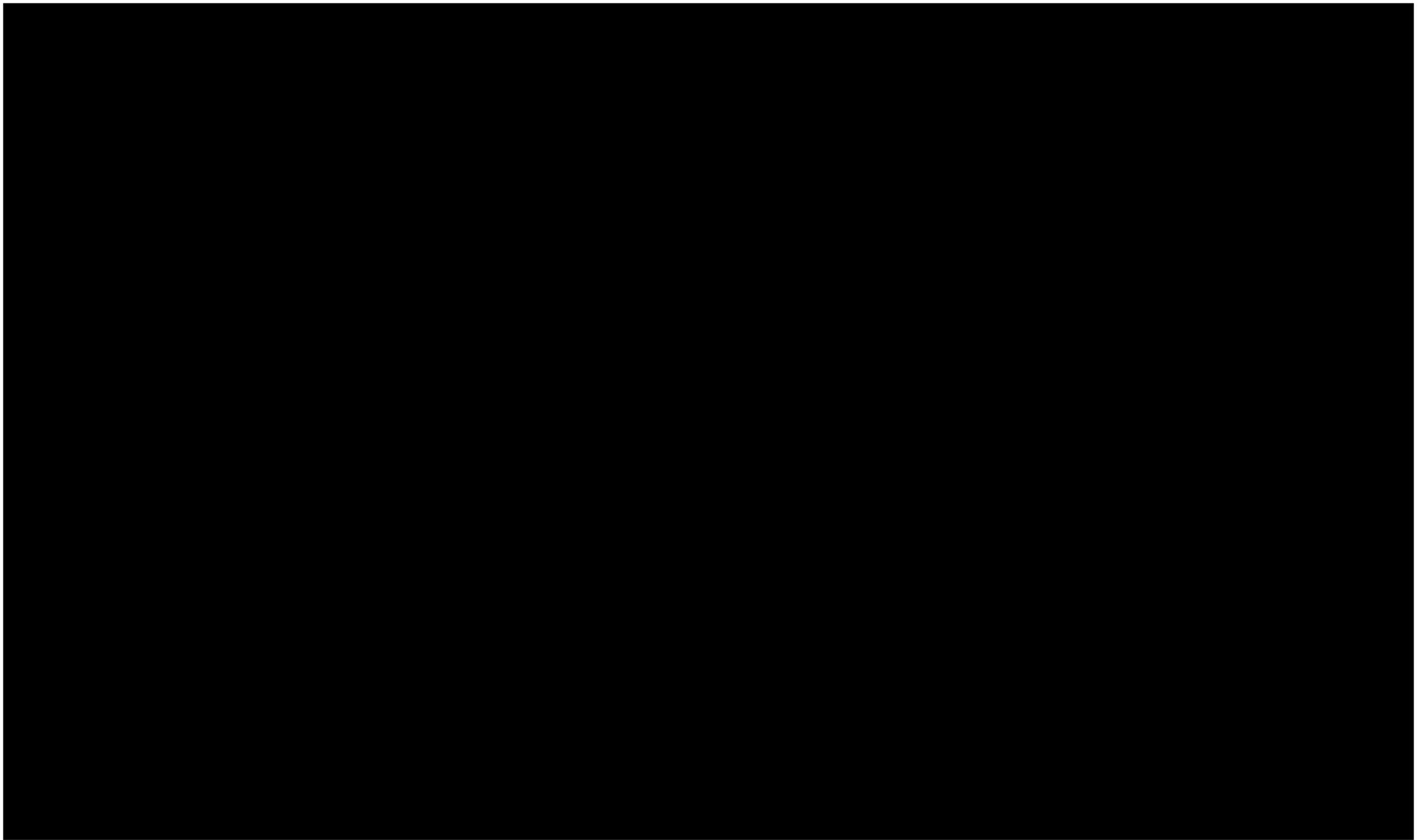
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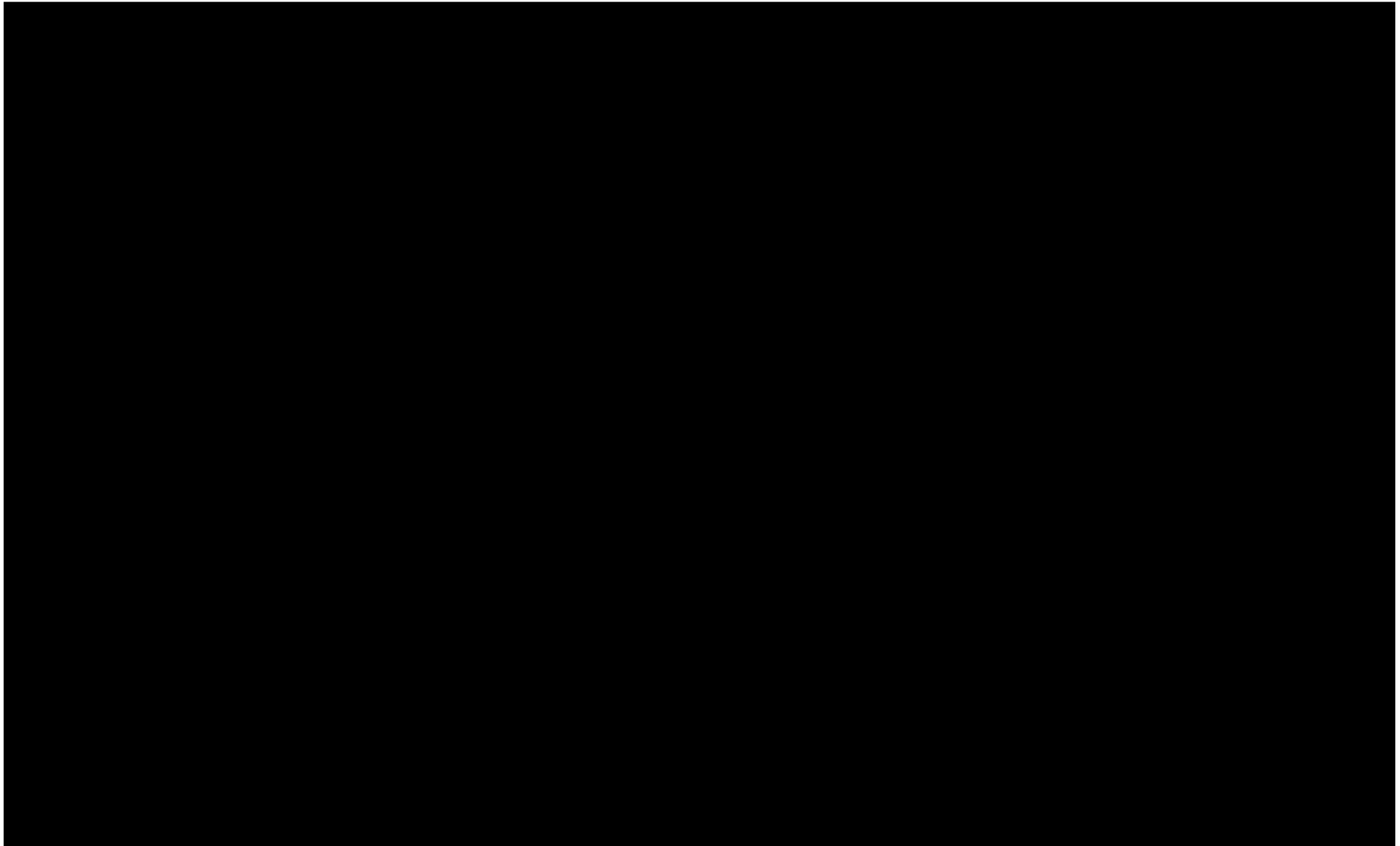
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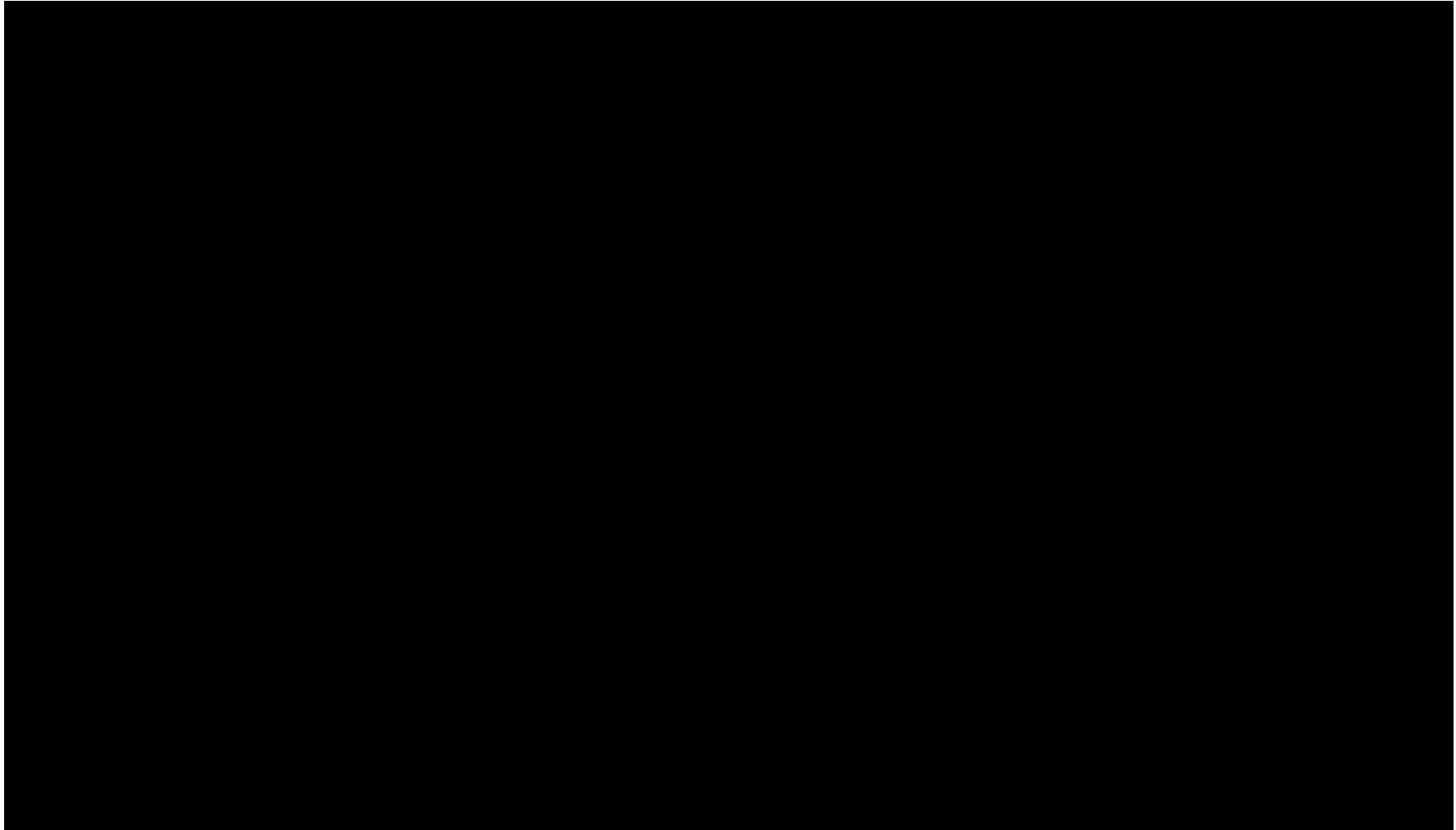
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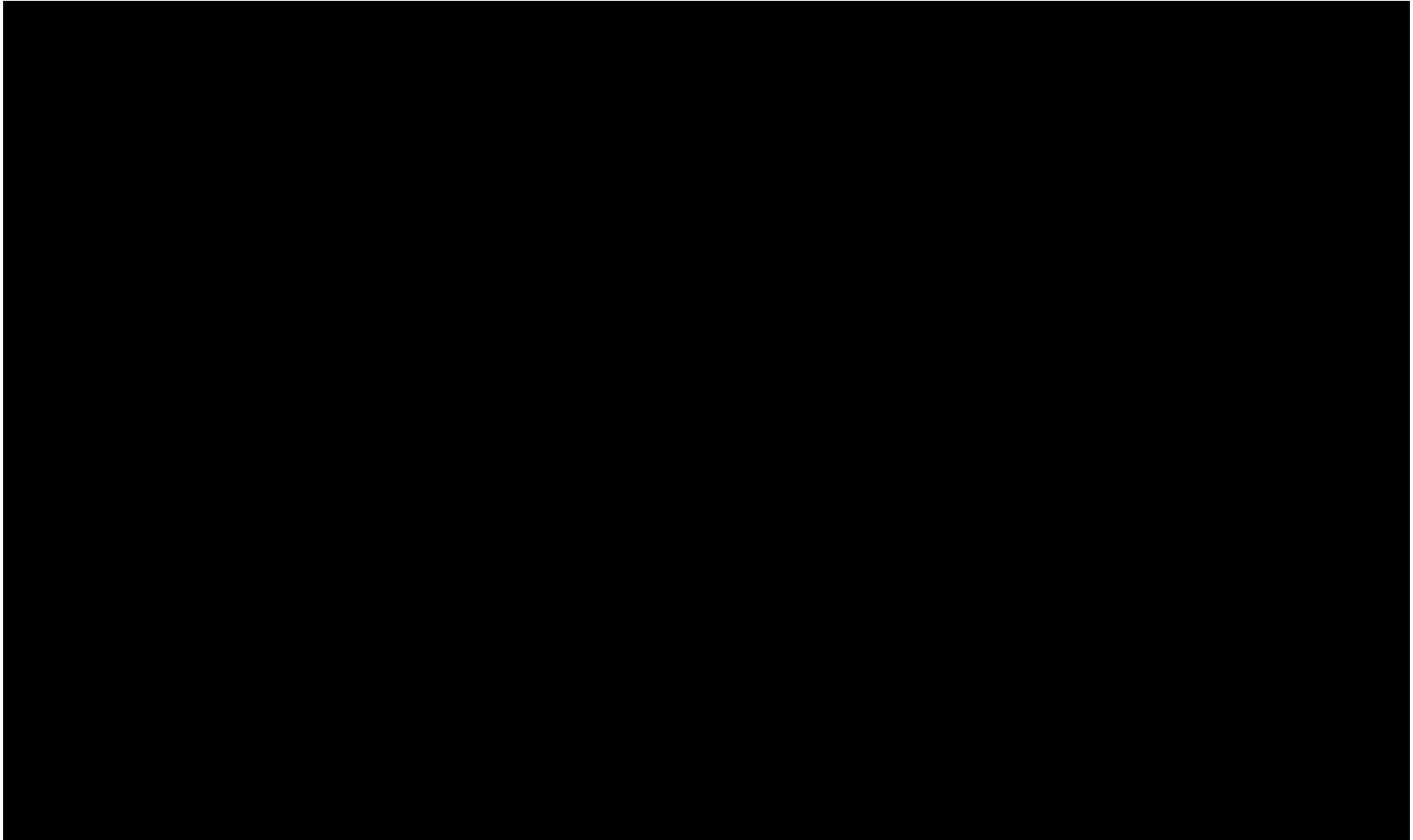
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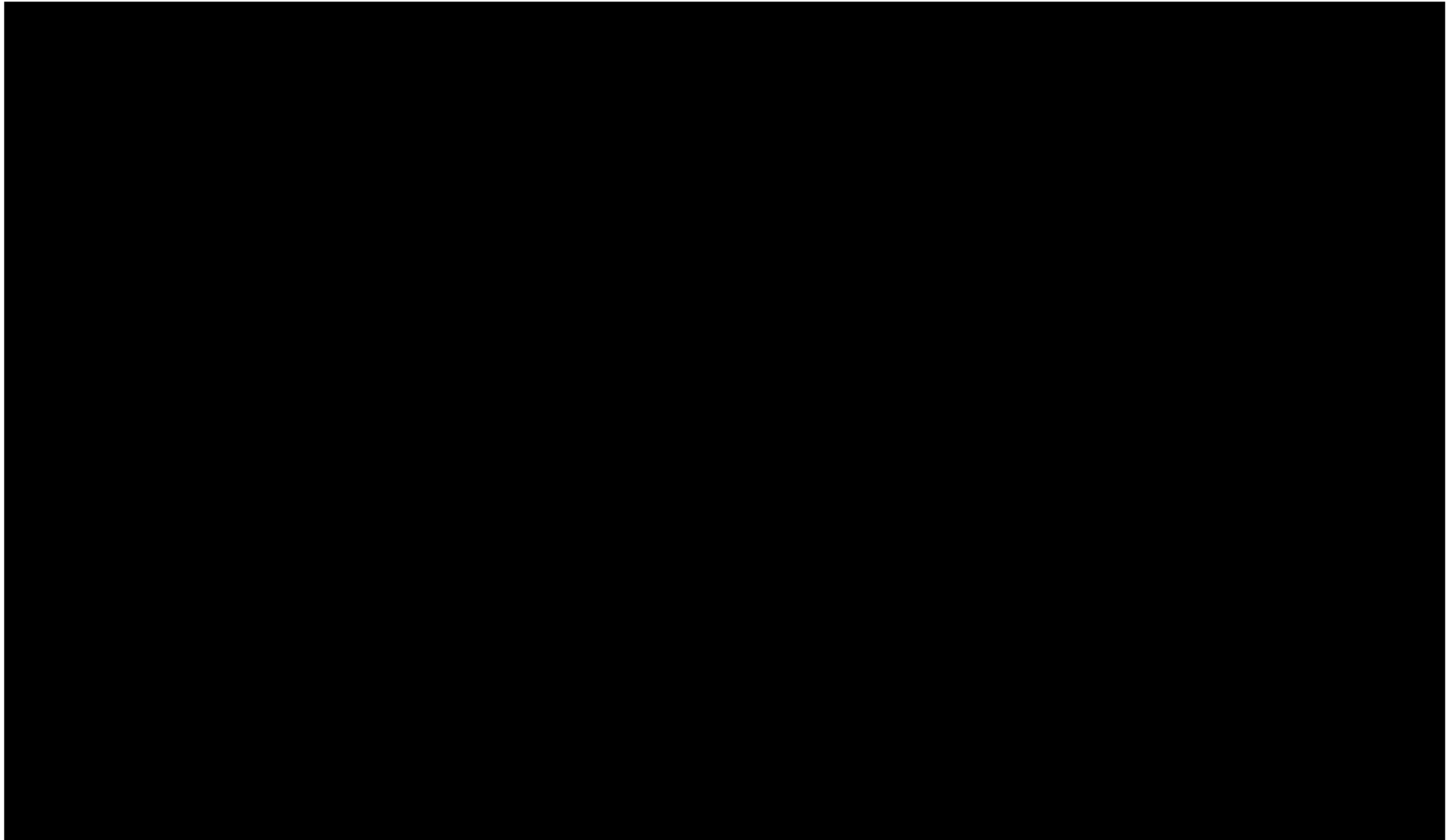


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1.2.4 Faults and Fractures [40 CFR 146.82(a)(3)(ii)]

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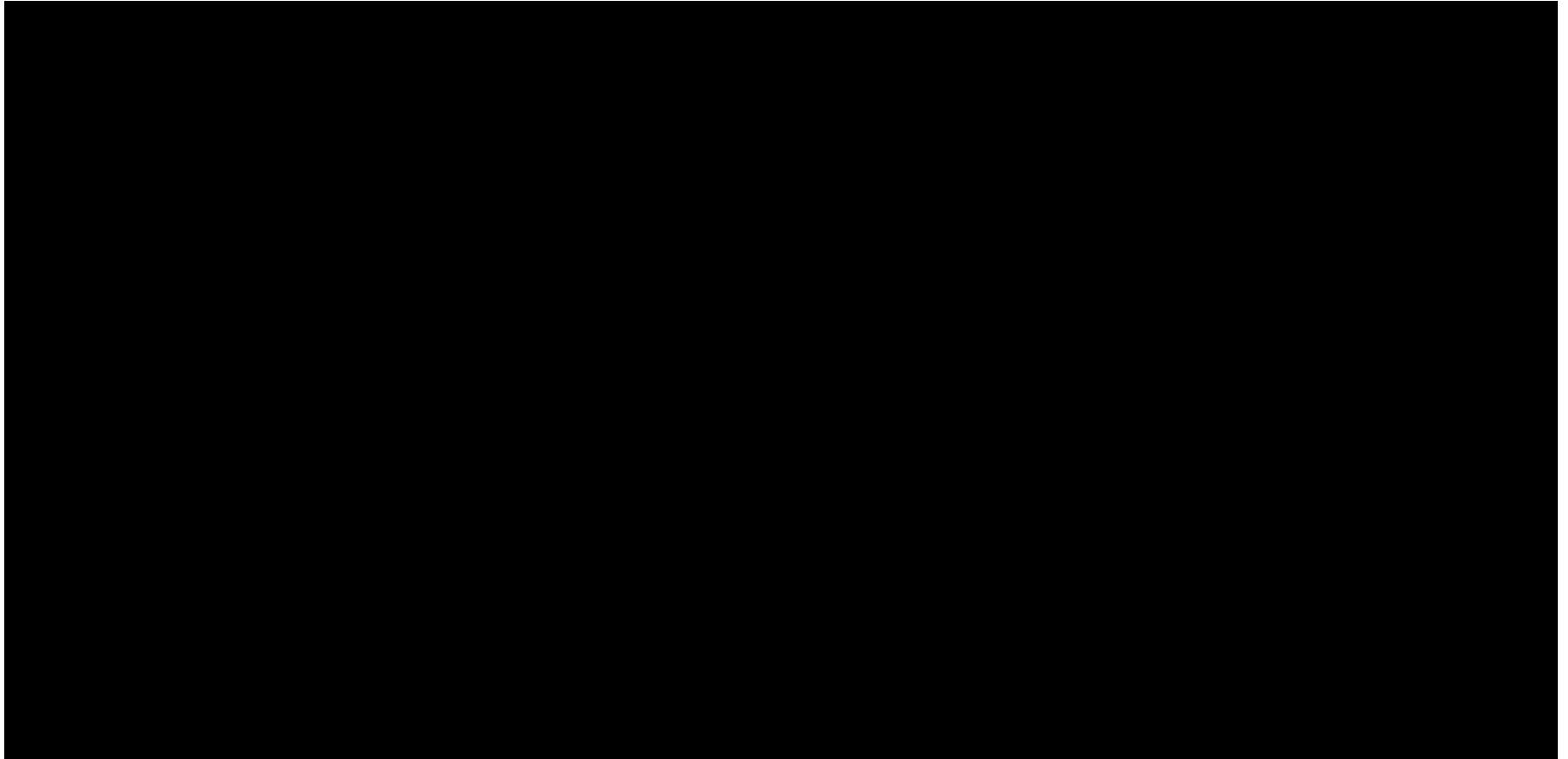
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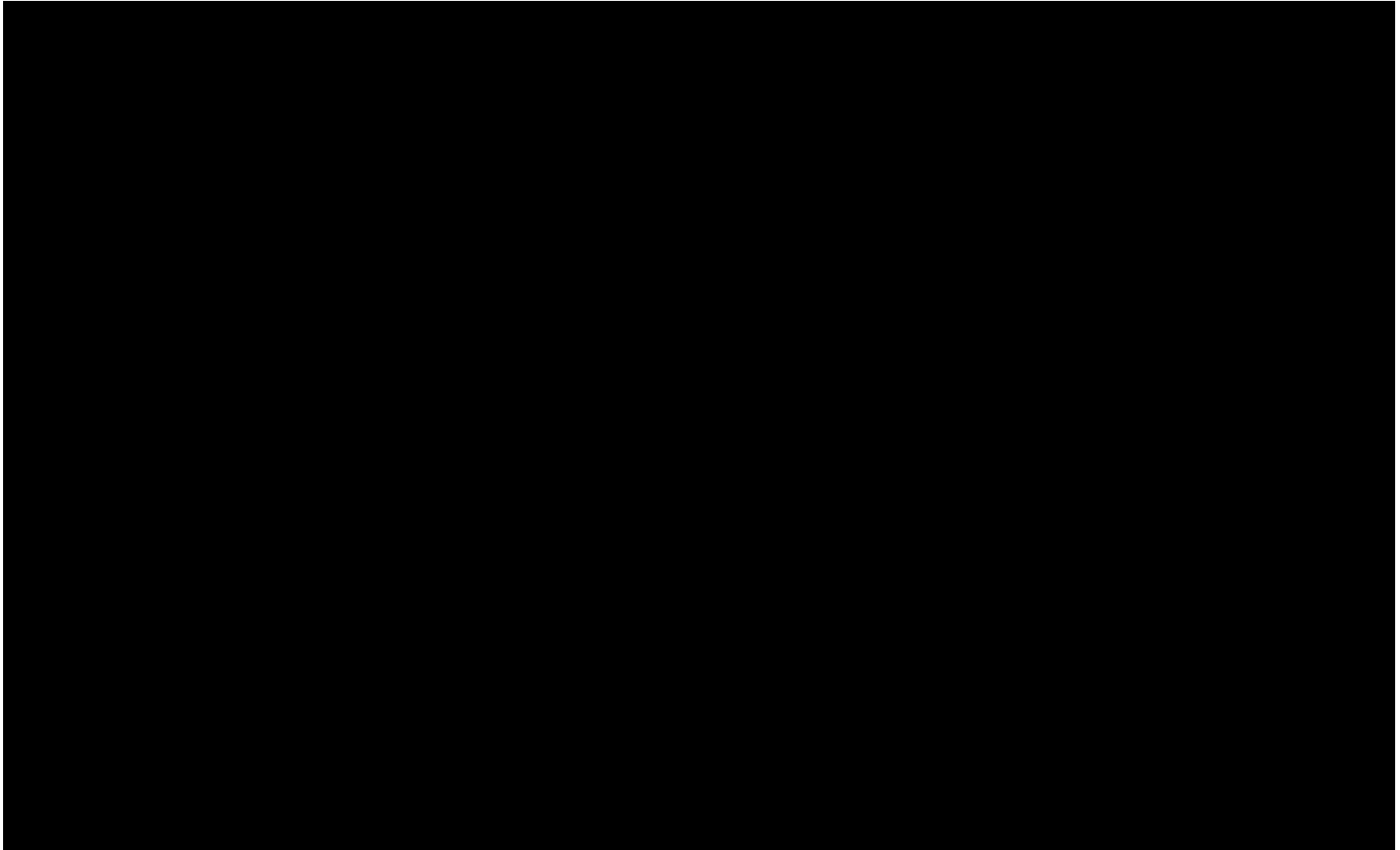
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1.2.5 Injection and Confining Zone Details [40 CFR 146.82(a)(3)(iii)]

[REDACTED]

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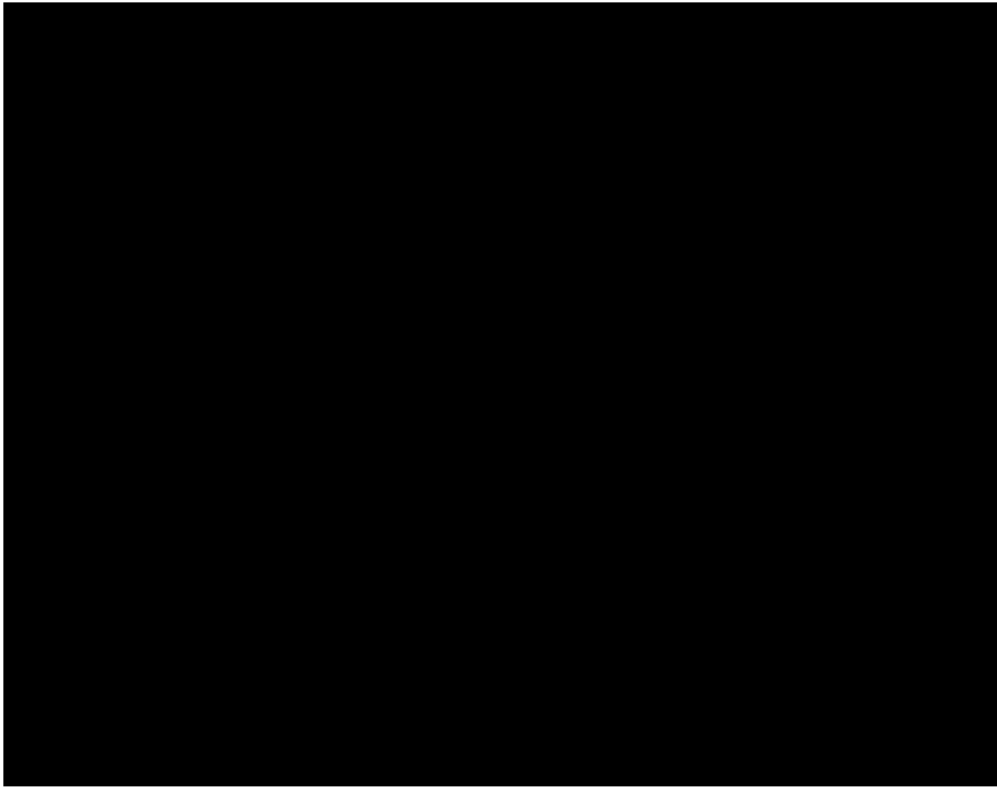
composition and potential cements are unknown without available core data in the vicinity of the

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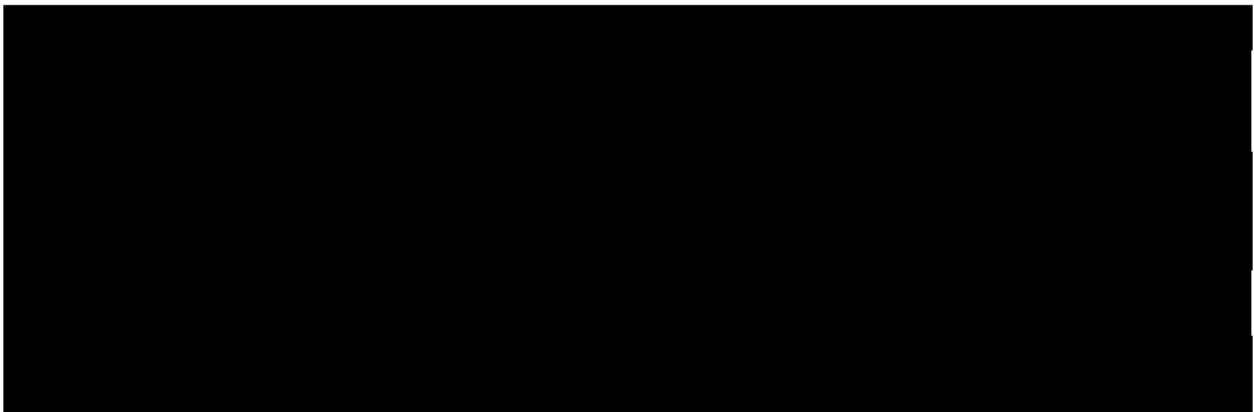
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[REDACTED]



1.2.6 Geomechanical and Petrophysical Information [40 CFR 146.82(a)(3)(iv)]

Only two wells within the region contain wireline acoustic logs of compressional and shear wave



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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[REDACTED]

1.2.7 Seismic History [40 CFR 146.82(a)(3)(v)]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1.2.8 Hydrologic and Hydrogeologic Information [40 CFR 146.82(a)(3)(vi), 146.82(a)(5)]

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[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

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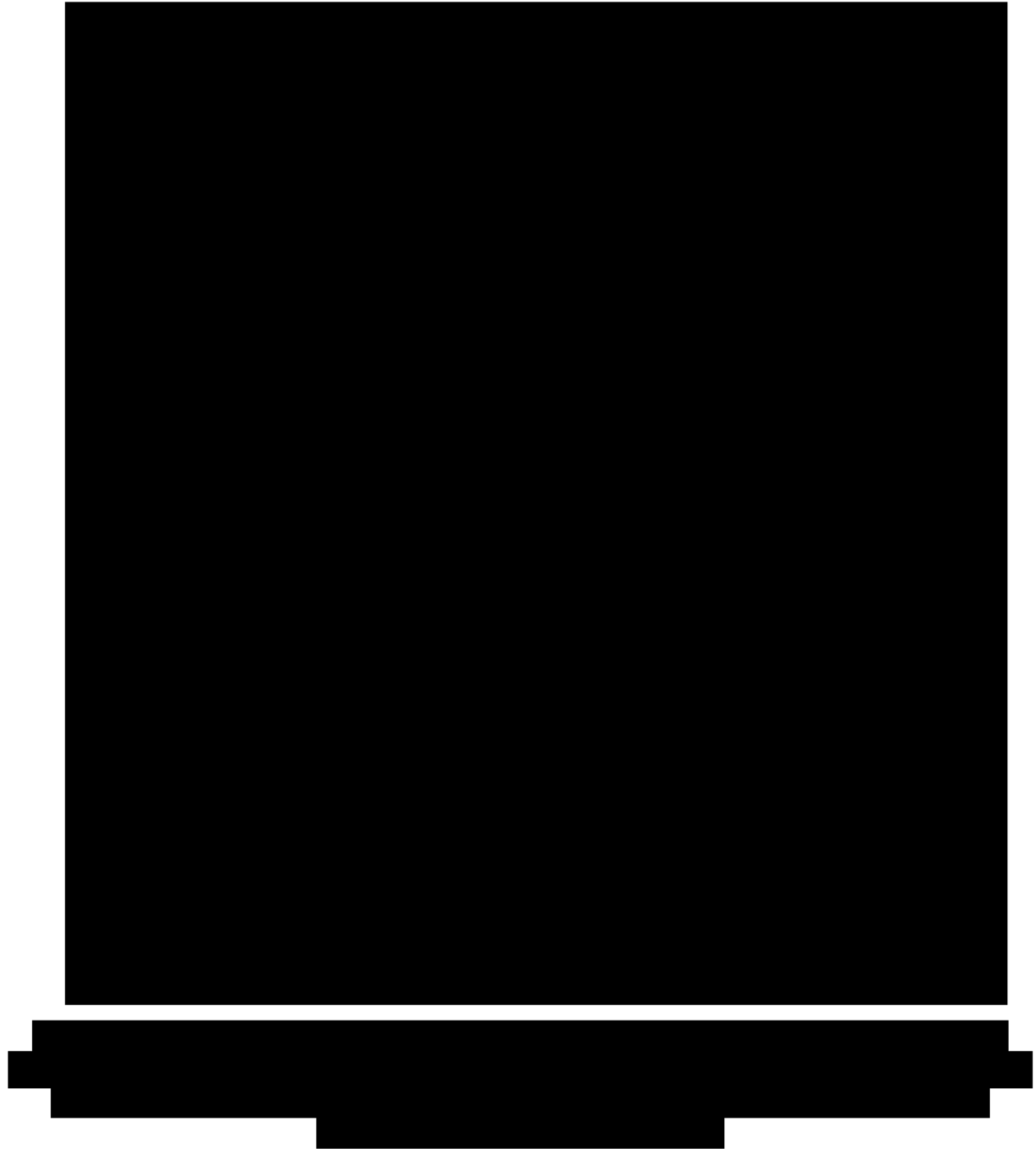
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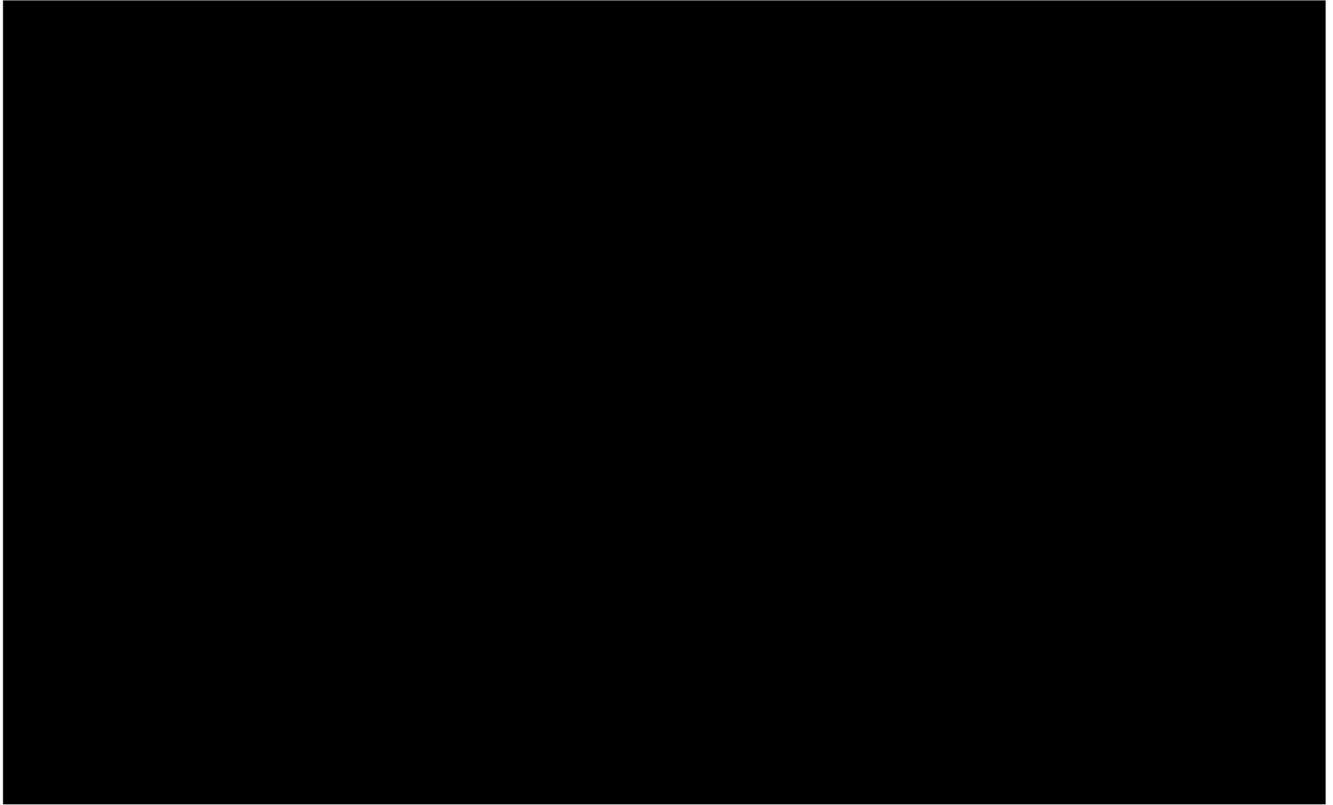
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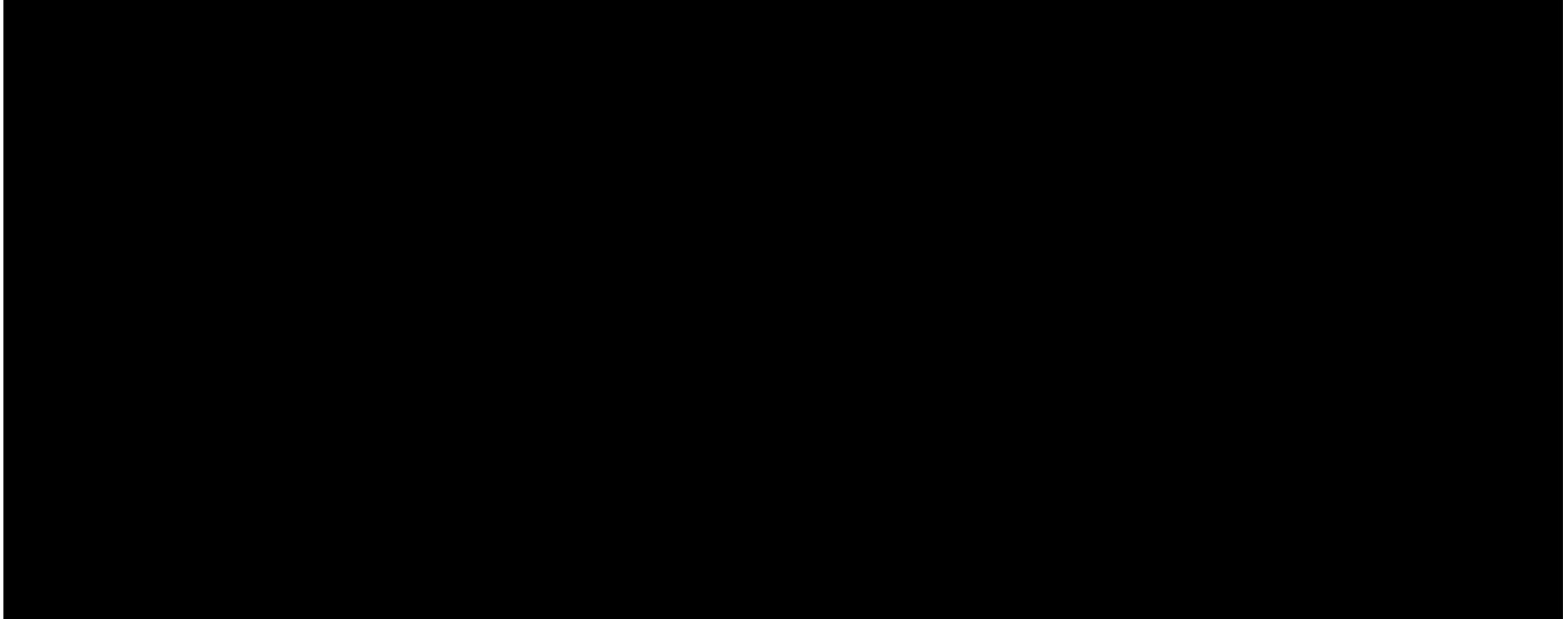
1.2.9 Geochemistry [40 CFR 146.82(a)(6)]

[REDACTED]

[REDACTED]

[REDACTED]







[REDACTED]

[REDACTED]

1.2.10 Other Information (Including Surface Air and/or Soil Gas Data, if Applicable)

[REDACTED]

1.3 Site Suitability [40 CFR 146.83]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1.4 **AoR and Corrective Action [40 CFR 146.84]**

AoR and Corrective Action GSDT Submissions

GSDT Module: AoR and Corrective Action

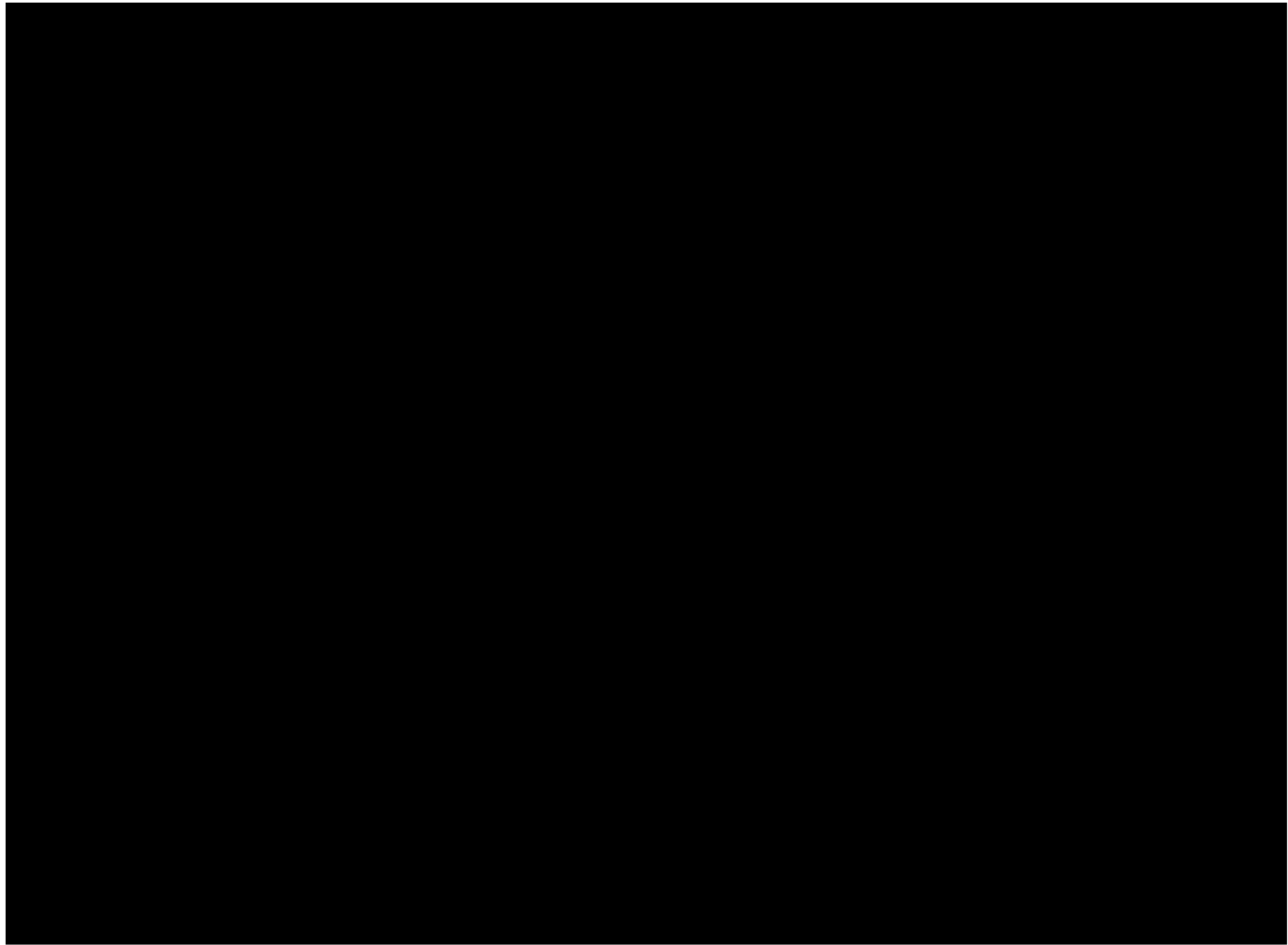
Tab(s): All applicable tabs

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

- ☒ Tabulation of all wells within AoR that penetrate confining zone **[40 CFR 146.82(a)(4)]**
- ☒ AoR and Corrective Action Plan **[40 CFR 146.82(a)(13) and 146.84(b)]**
- ☒ Computational modeling details **[40 CFR 146.84(c)]**

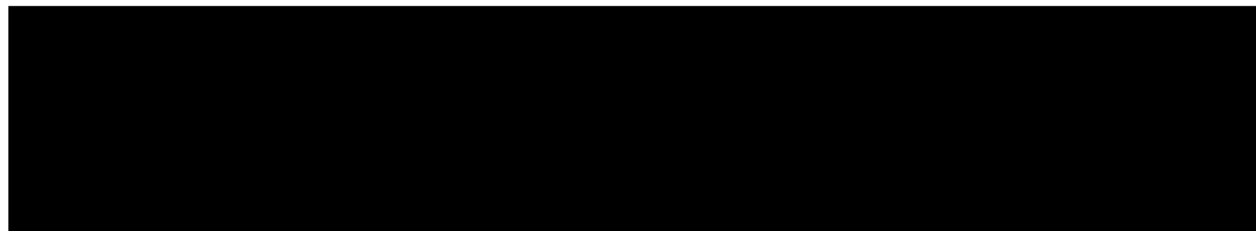
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[REDACTED]



1.5 Financial Responsibility

Financial Responsibility GSDT Submissions
<p>GSDT Module: Financial Responsibility Demonstration</p> <p>Tab(s): Cost Estimate tab and all applicable financial instrument tabs</p> <p>Please use the checkbox(es) to verify the following information was submitted to the GSDT:</p> <p><input checked="" type="checkbox"/> Demonstration of financial responsibility [40 CFR 146.82(a)(14) and 146.85]</p>



[REDACTED]

1.6 Injection Well Construction

[REDACTED]

1.6.1 Proposed Stimulation Program [40 CFR 146.82(a)(9)]

[REDACTED]

1.6.2 Construction Procedures [40 CFR 146.82(a)(12)]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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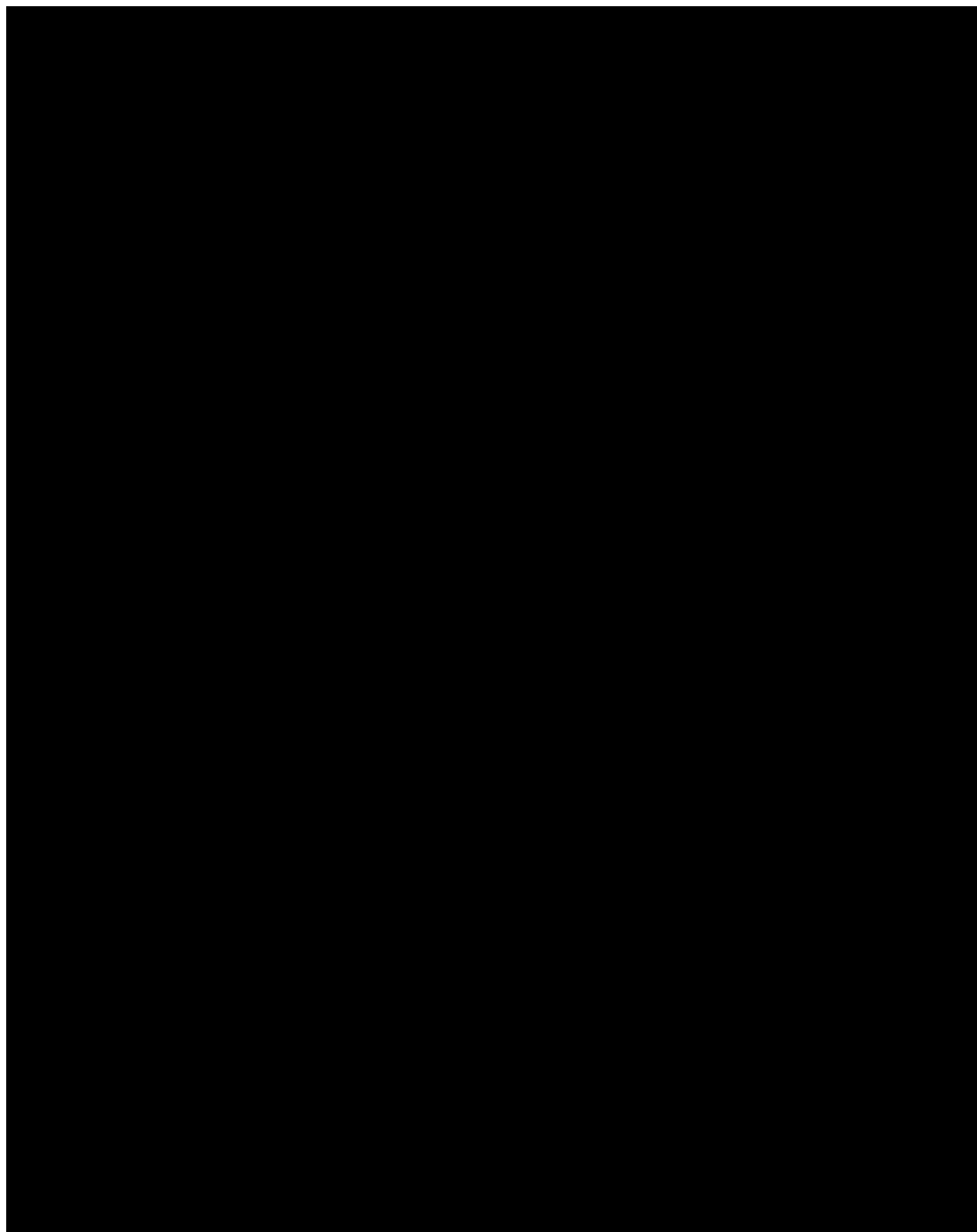
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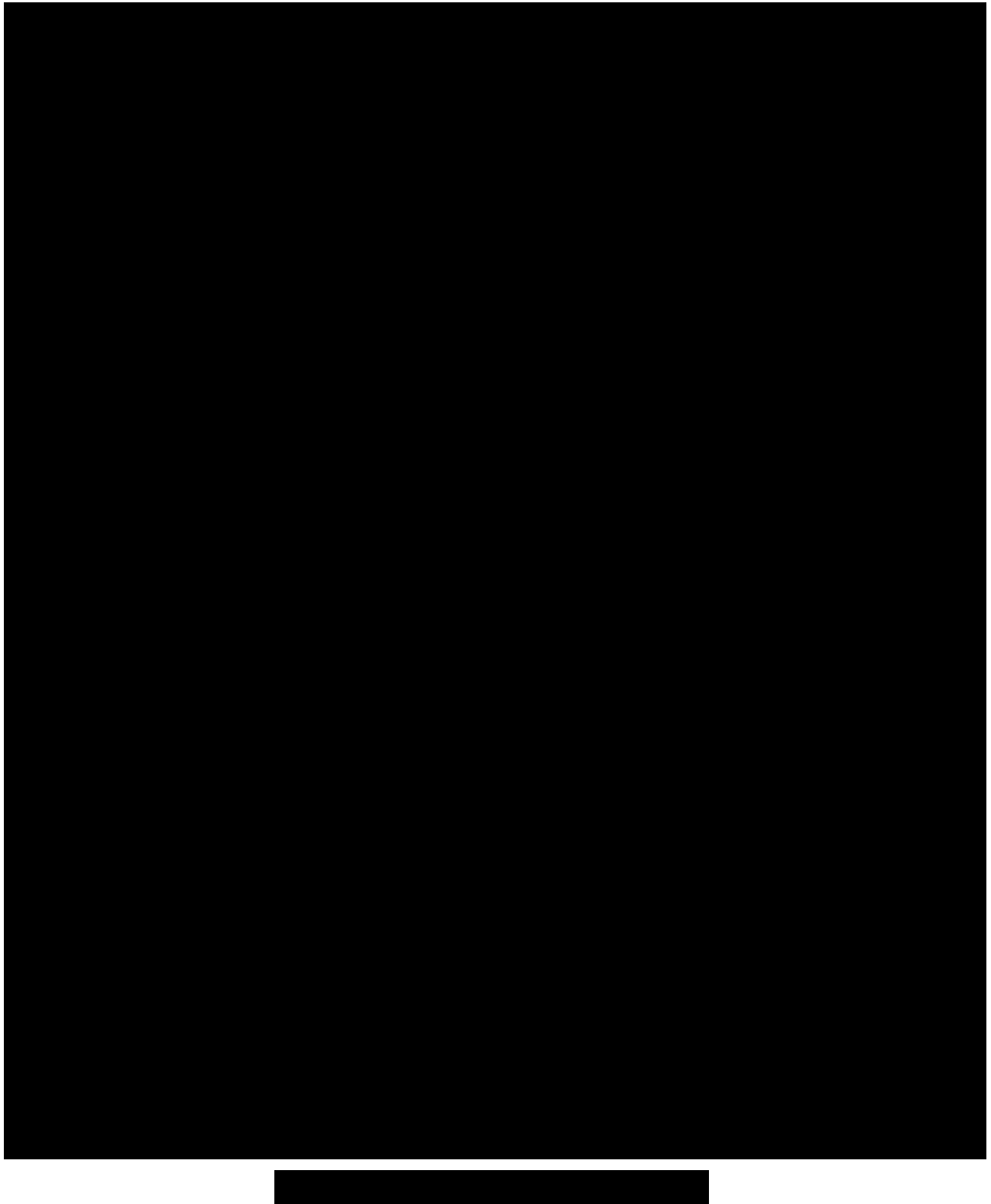
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[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]





1.7 Pre-Operational Logging and Testing

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1.8 Well Operation

[REDACTED]

1.8.1 Operational Procedures [40 CFR 146.82(a)(10)]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[illegible]

Calgren Renewable Fuels will initially be the primary source of CO₂ for the TCCSP, but additional

[REDACTED]

[illegible]

1.9 Testing and Monitoring Plan

Testing and Monitoring GSDT Submissions

GSDT Module: Project Plan Submissions

Tab(s): Testing and Monitoring tab

Please use the checkbox(es) to verify the following information was submitted to the GSĐT:

☒ Testing and Monitoring Plan [40 CFR 146.82(a)(15) and 146.90]

The **Testing and Monitoring Plan** describes how TCCSP, LLC. will monitor injection operations,

the CO₂ stream will be determined through sample collection and analysis and will be conducted

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
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[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[illegible]

1.10 Injection Well Plugging

Injection Well Plugging GSDT Submissions

GSDT Module: Project Plan Submissions

Tab(s): Injection Well Plugging tab

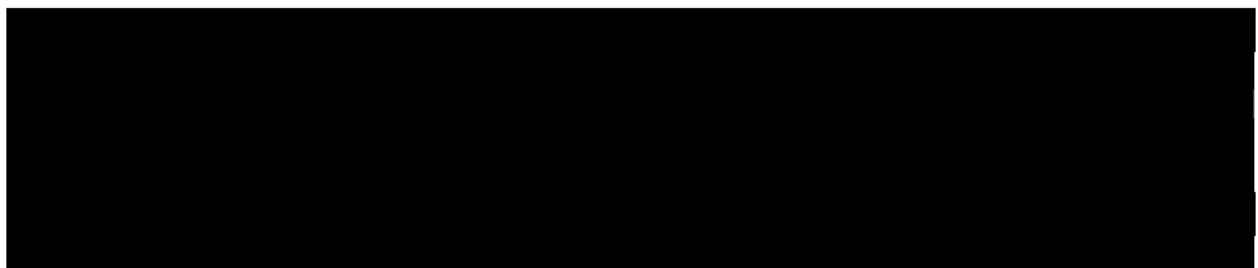
Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Injection Well Plugging Plan [40 CFR 146.82(a)(16) and 146.92(b)]



1.11 Post-Injection Site Care (PISC) and Site Closure

PISC and Site Closure GSDT Submissions
<i>GSDT Module:</i> Project Plan Submissions <i>Tab(s):</i> PISC and Site Closure tab
Please use the checkbox(es) to verify the following information was submitted to the GSDT: <input checked="" type="checkbox"/> PISC and Site Closure Plan [40 CFR 146.82(a)(17) and 146.93(a)]
<i>GSDT Module:</i> Alternative PISC Timeframe Demonstration <i>Tab(s):</i> All tabs (only if an alternative PISC timeframe is requested)
Please use the checkbox(es) to verify the following information was submitted to the GSDT: <input checked="" type="checkbox"/> Alternative PISC timeframe demonstration [40 CFR 146.82(a)(18) and 146.93(c)]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1.12 Emergency and Remedial Response

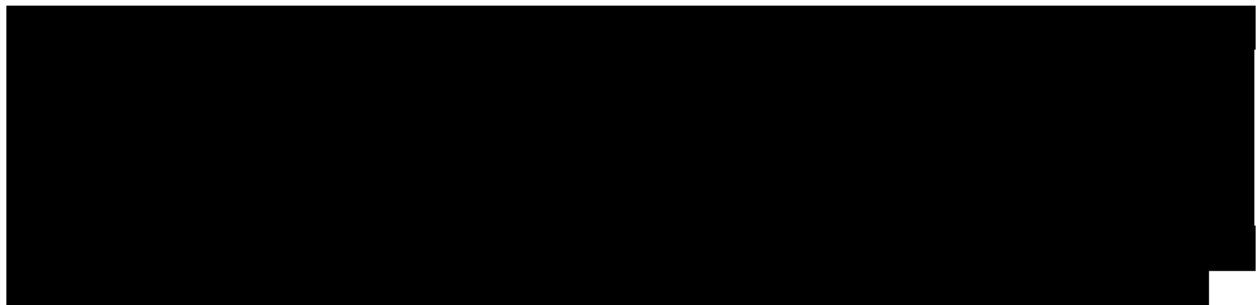
Emergency and Remedial Response GSDT Submissions

GSDT Module: Project Plan Submissions

Tab(s): Emergency and Remedial Response tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Emergency and Remedial Response Plan [40 CFR 146.82(a)(19) and 146.94(a)]



1.13 Injection Depth Waiver and Aquifer Exemption Expansion

Injection Depth Waiver and Aquifer Exemption Expansion GSDT Submissions

GSDT Module: Injection Depth Waivers and Aquifer Exemption Expansions

Tab(s): All applicable tabs

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

- ☐ Injection Depth Waiver supplemental report *[40 CFR 146.82(d) and 146.95(a)]*
 - ☐ Aquifer exemption expansion request and data *[40 CFR 146.4(d) and 144.7(d)]*

Not Applicable for TCCSP.

1.14 Other Information

Not Applicable for TCCSP.

1.15 Environmental Justice

TCCSP is located in Tulare County, California. Tulare County is located south of Fresno and north

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

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1.17 Appendix

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