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Soil-Bentonite Cutoff Wall Through Free-Product at Indiana Harbor CDF

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Geotechnical Section, Chicago District

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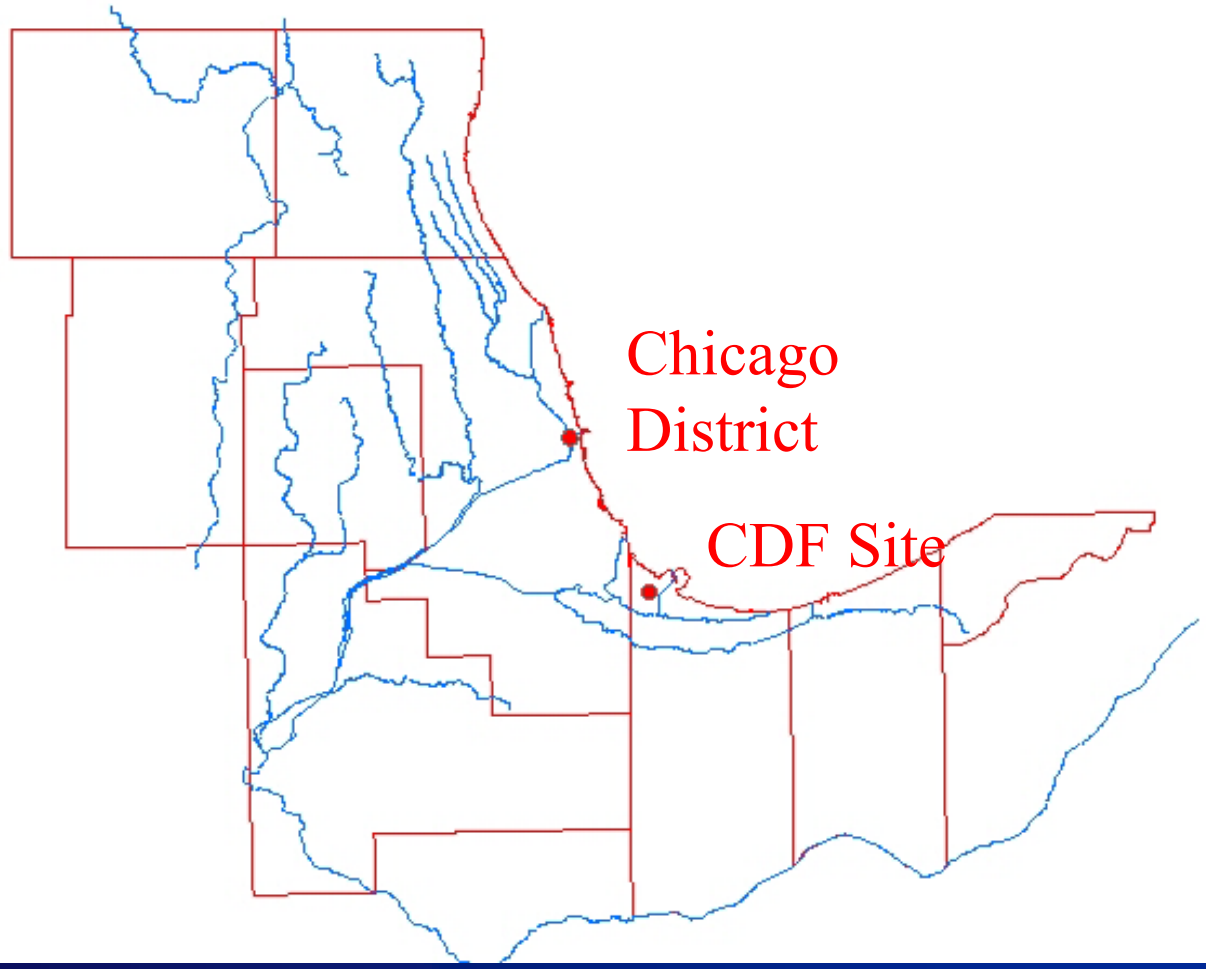
Project Location



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Site Rationale

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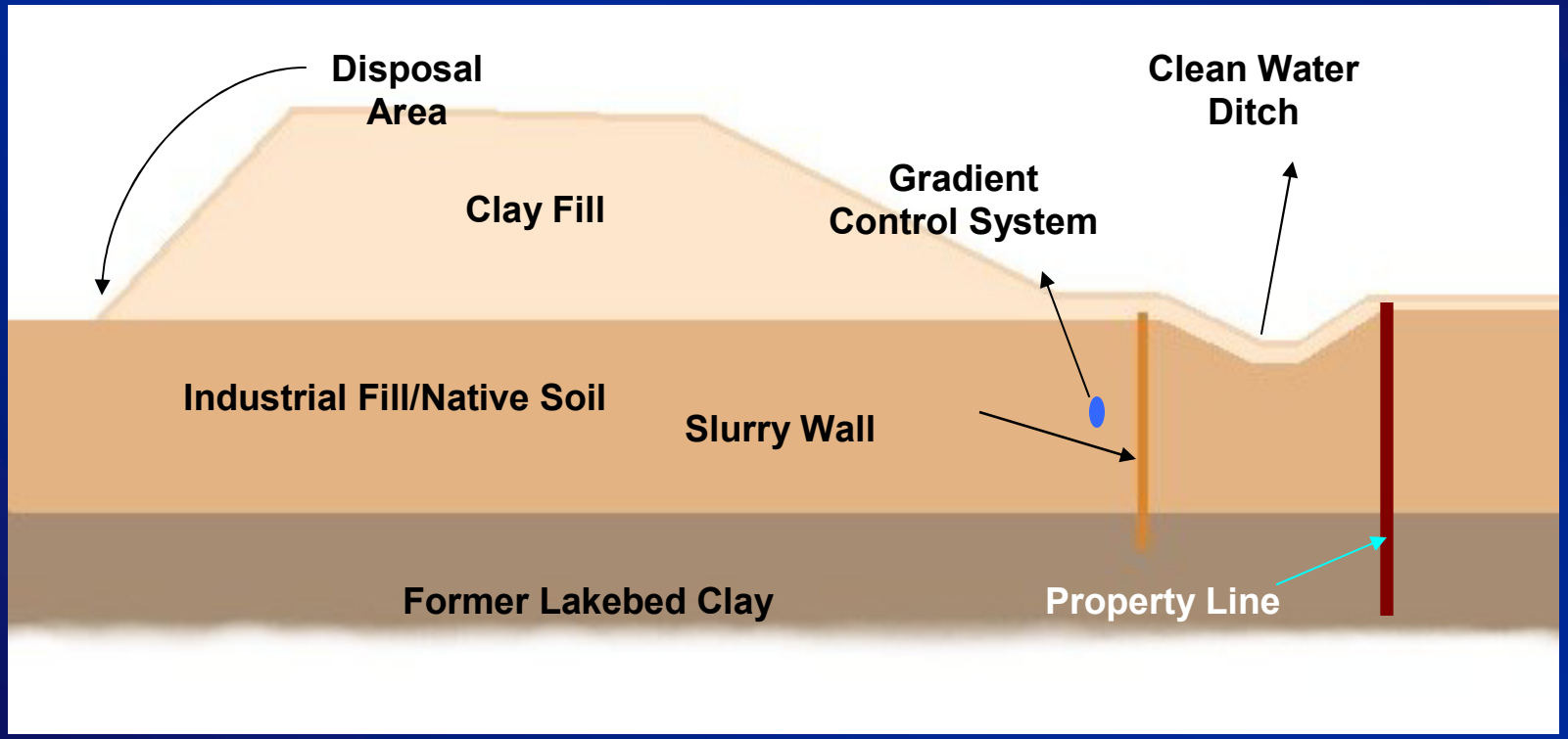
Site Geology and Design Purpose



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Cutoff Wall Construction

Step 1.

Step 2.

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Implementation Steps

- Soil Borings
- Compatibility Testing
- Test Section
- Obstruction Removal
- Cutoff Wall Construction Quality Control/Quality Assurance

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Soil Borings

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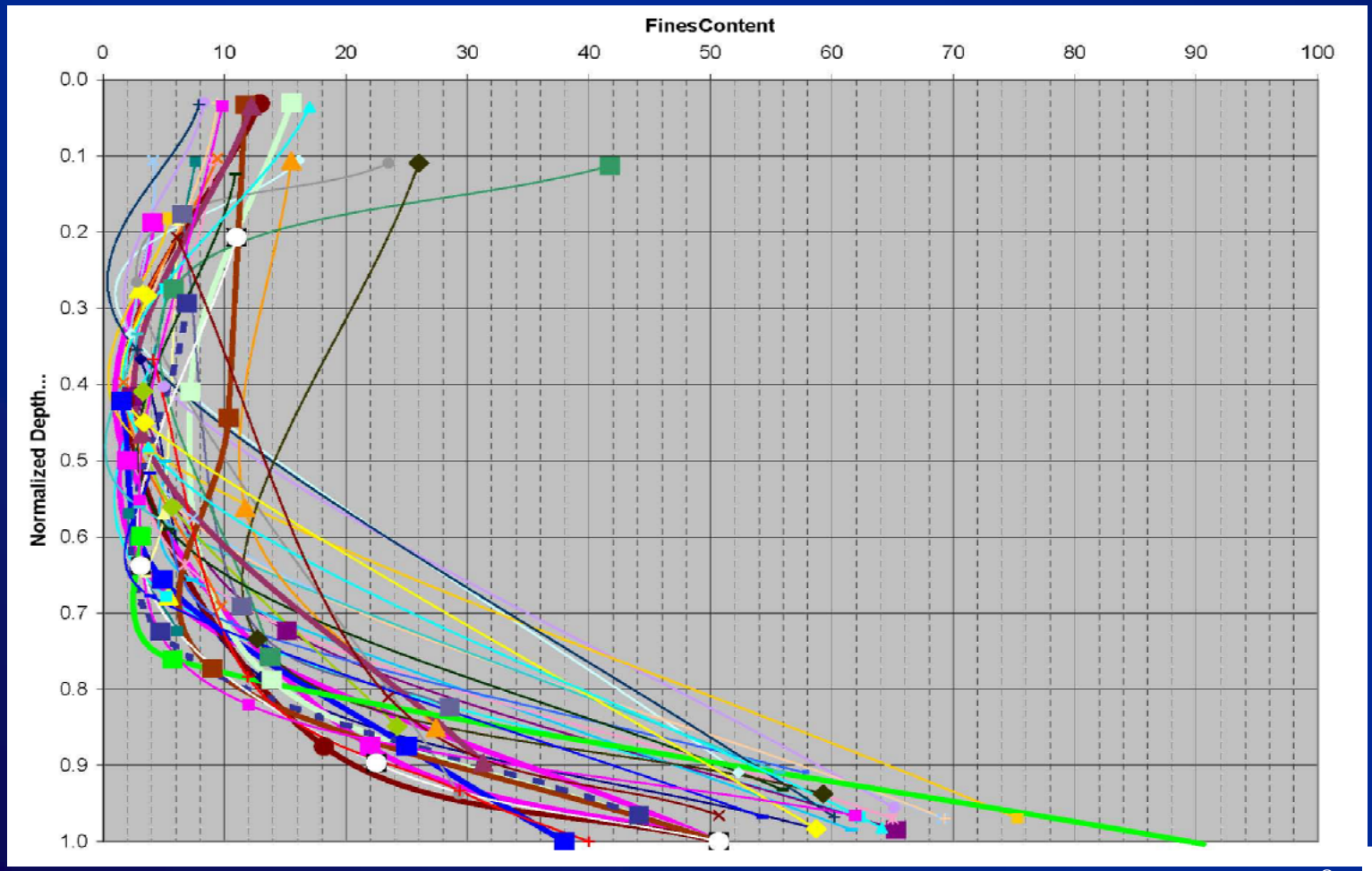
Fines Vs. Depth



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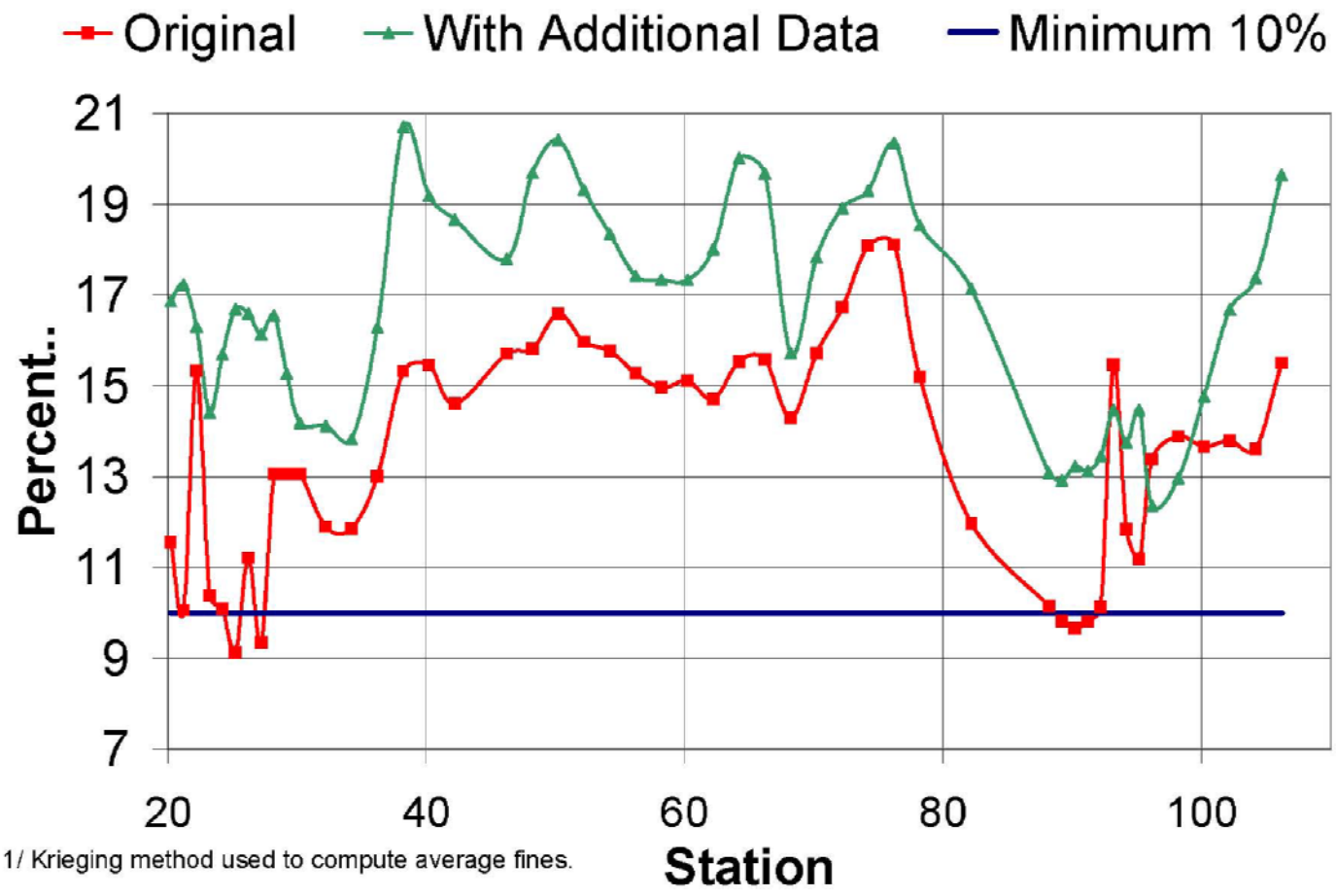
Average Fines



1/ Krieging method used to compute average fines.

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Compatibility Testing

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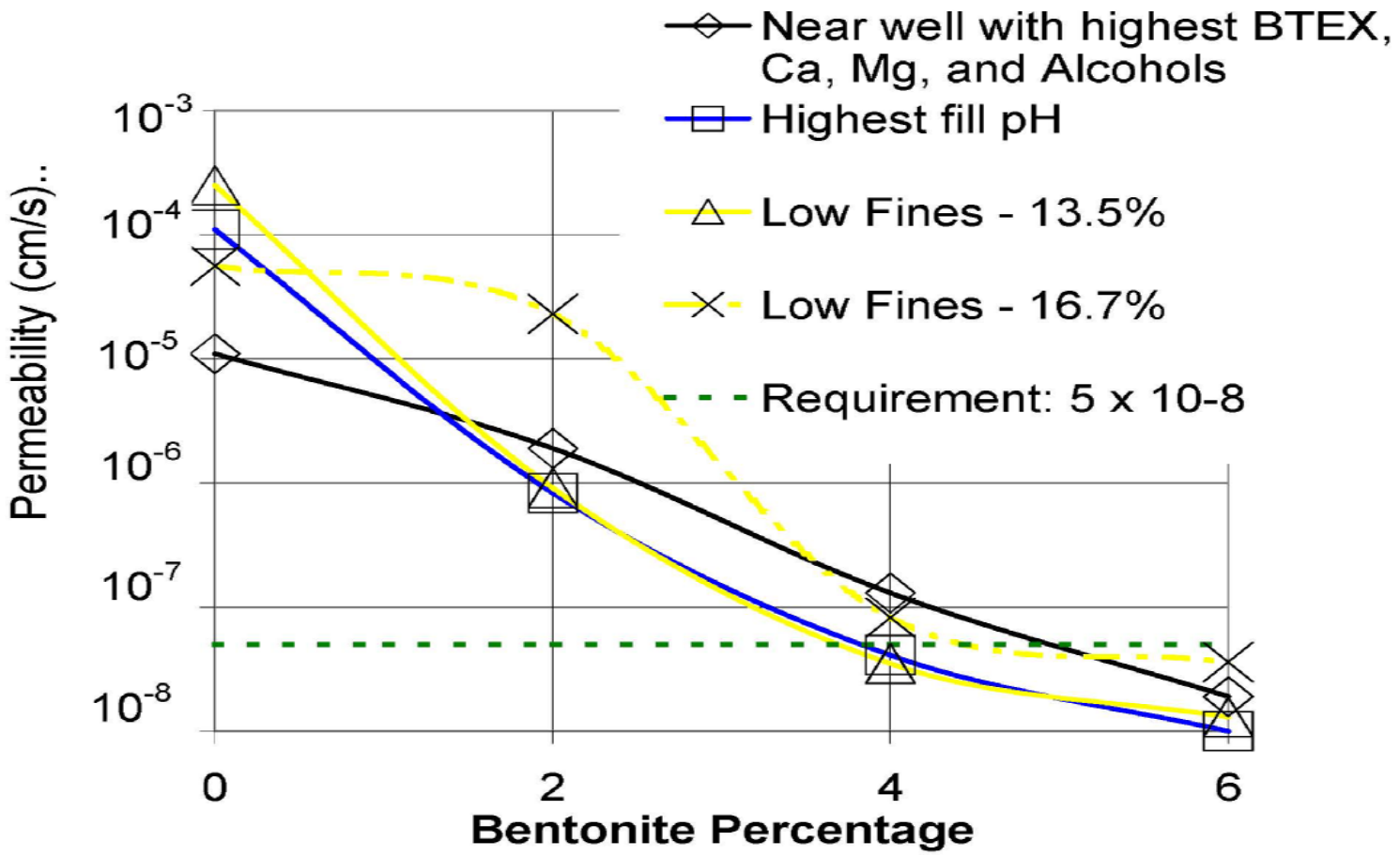
Short Term Compatibility



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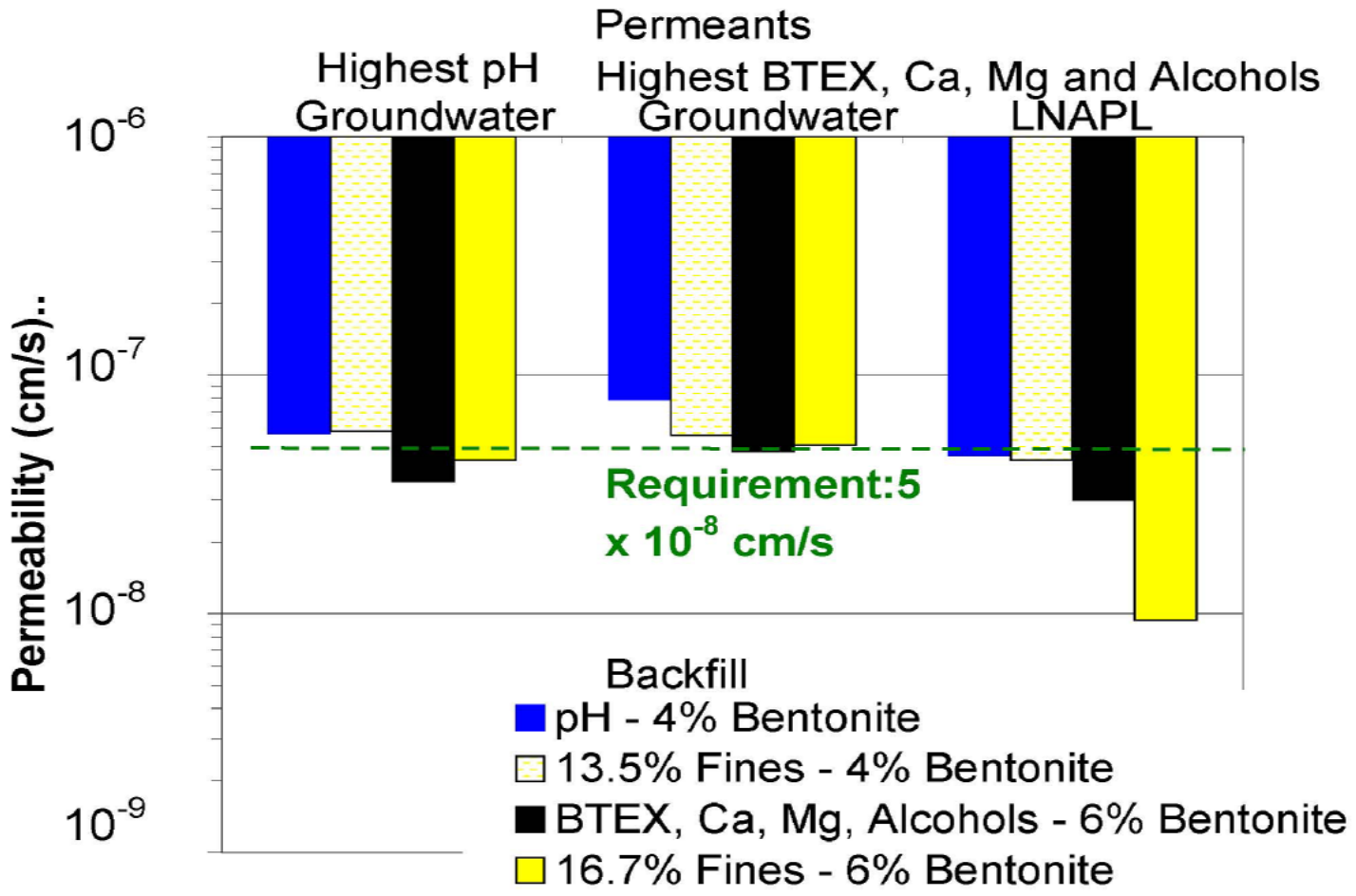
Long Term Compatibility



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Test Section

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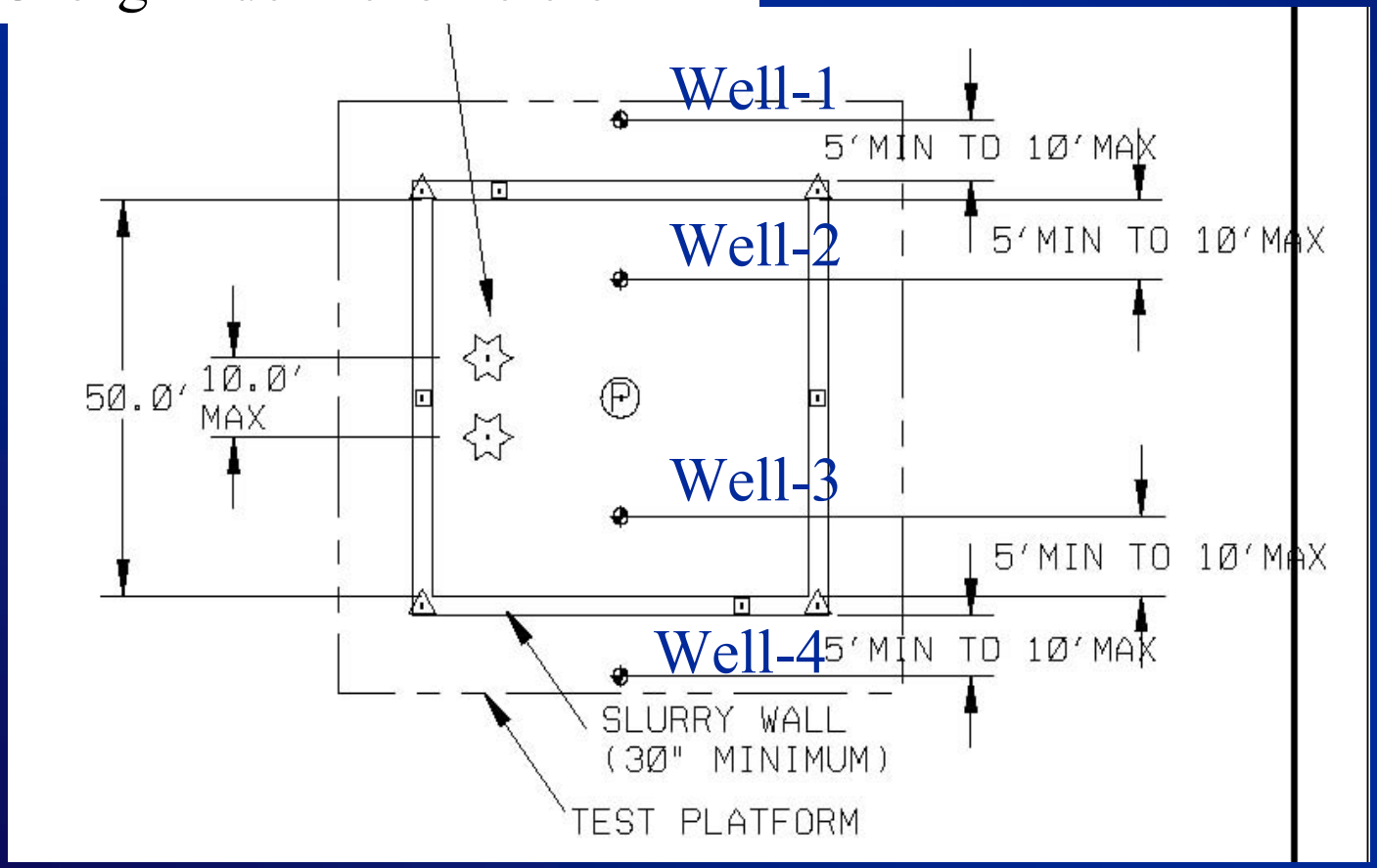
Test Section

Casagrande Piezometers



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Obstruction Removal Dewatering

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Obstruction Removal
Oil-Water Separator

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Obstruction Removal - Pipes

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Obstruction Removal – Concrete Foundations

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Quality Control/Quality Assurance

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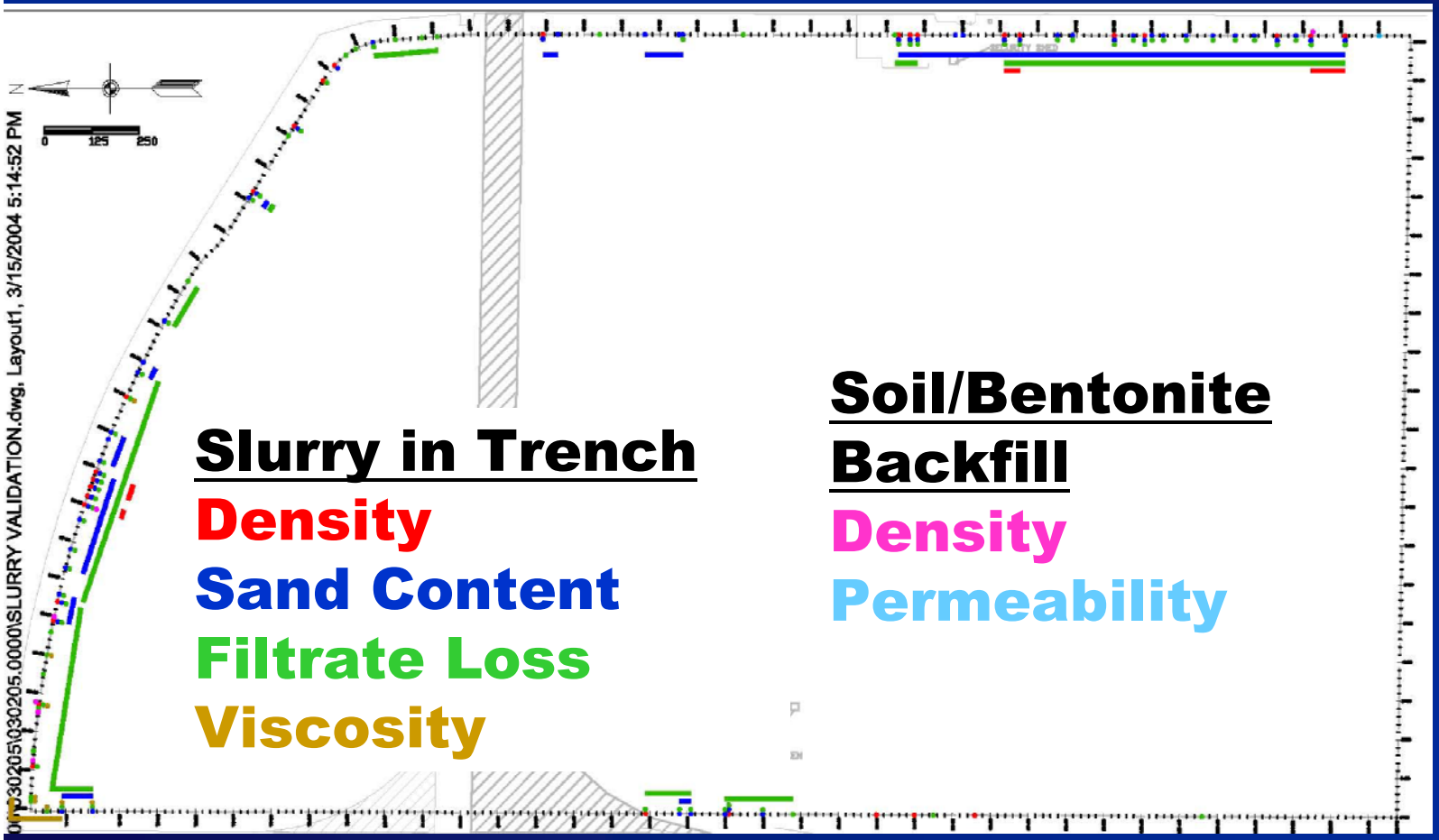
Quality Control Issues



Slurry in Trench
Density
Sand Content
Filtrate Loss
Viscosity

Soil/Bentonite Backfill
Density
Permeability

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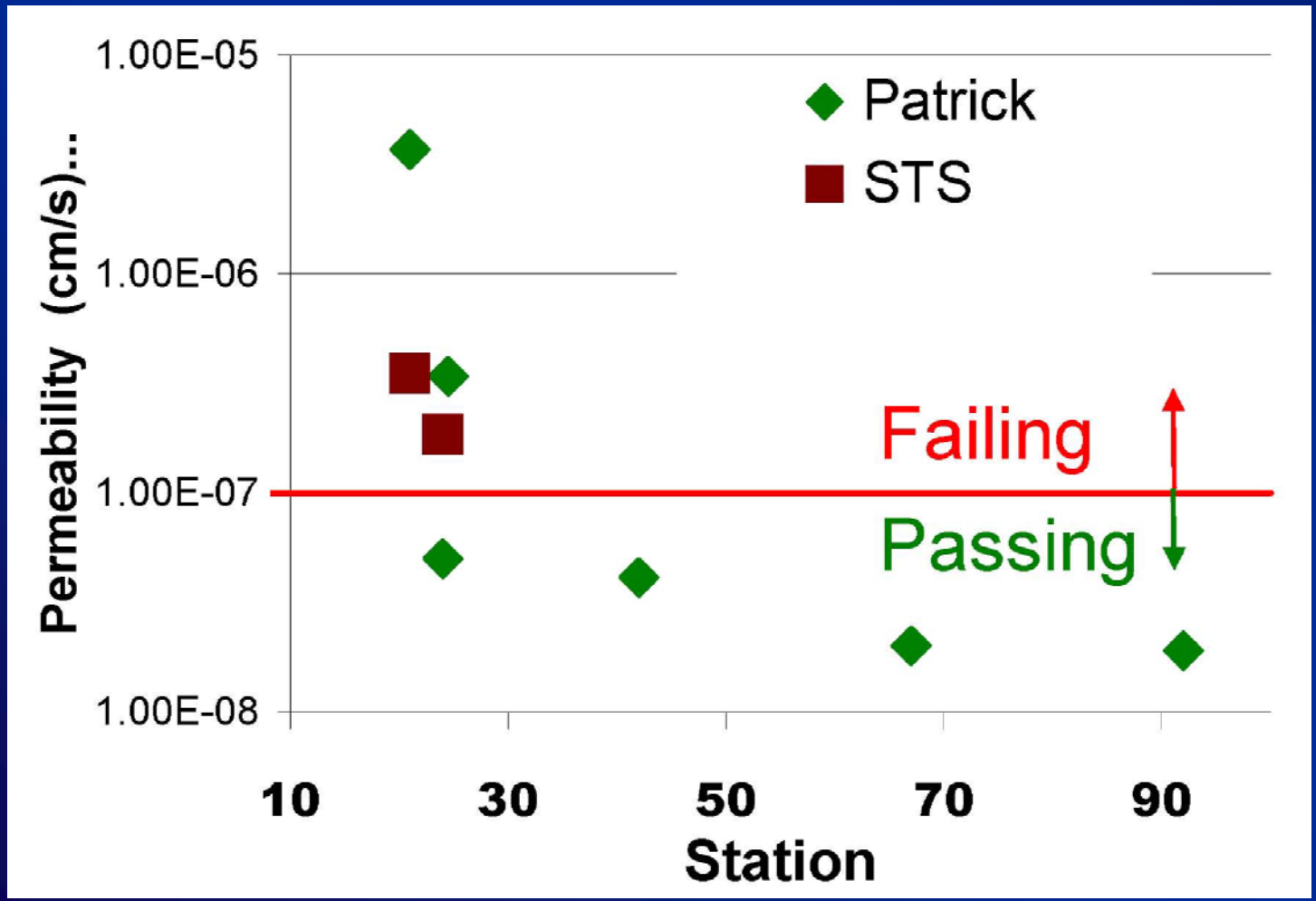
Quality Assurance – Duplicate Permeability



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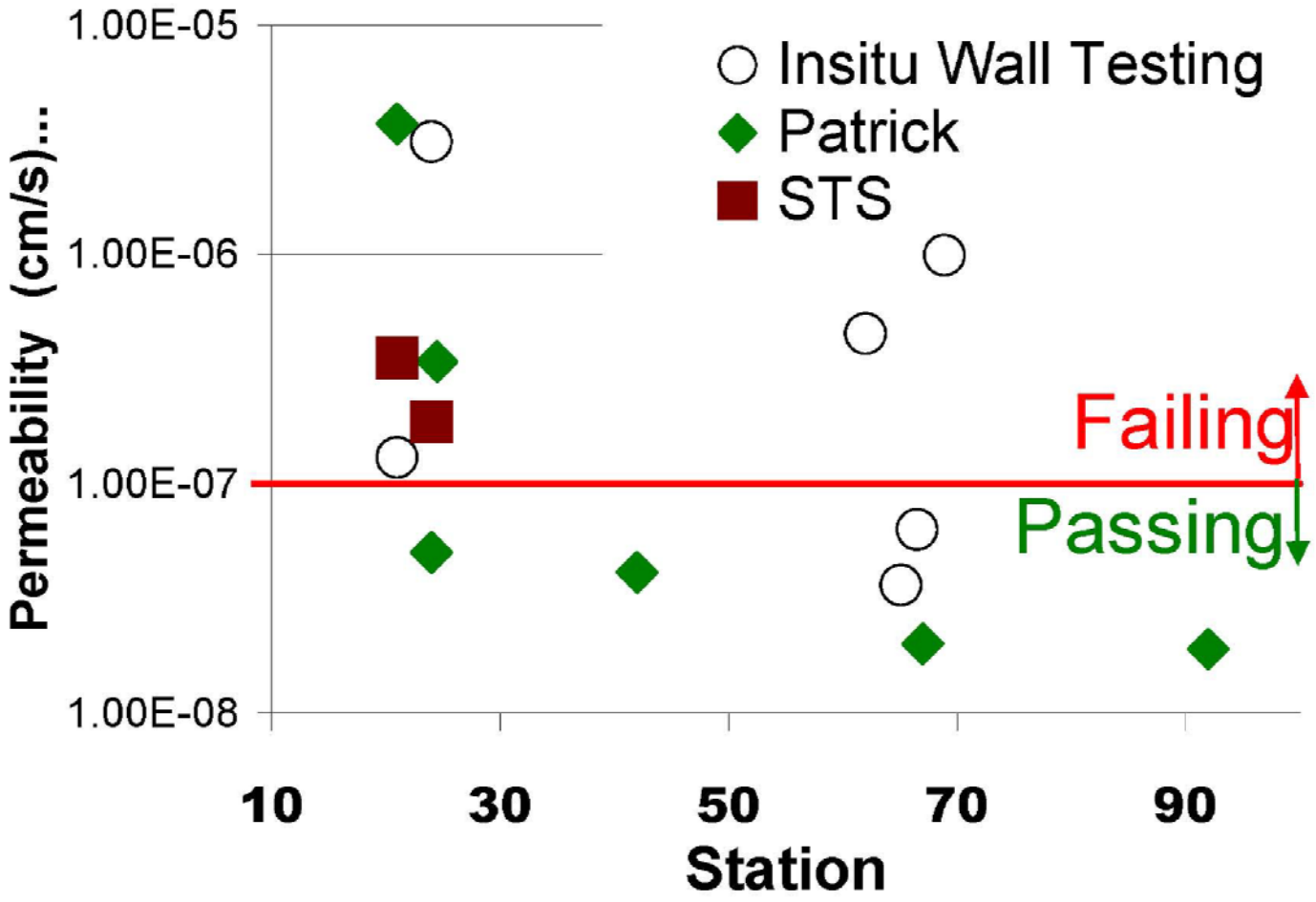
Quality Assurance – Duplicate Permeability



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Conclusions

- Required 6% Bentonite to Achieve 10^{-7} cm/s permeability
- Quality Control/Quality Assurance Vital
- Design Staff Should be Involved in Implementation

Questions?

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Quality Control - Slurry

Test	Requirement	Rationale
Density	15 pcf < backfill	Displace Slurry
Sand Content	30%	Keep sand in suspension
Viscosity	40 – 90 s	Keep trench open, slurry displaceable
Filtrate Loss	< 25 cm^3	Maintain filter cake

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Quality Control - Backfill

Test	Requirement	Rationale
Density	15 pcf > slurry	Displace slurry
Permeability	< 1 x 10-7 cm/s	Reduce flow through wall

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Quality Assurance – Wall Repair Summary