



Greatest Challenges to Effective CCR Management



Presentation to Mcilvaine Company

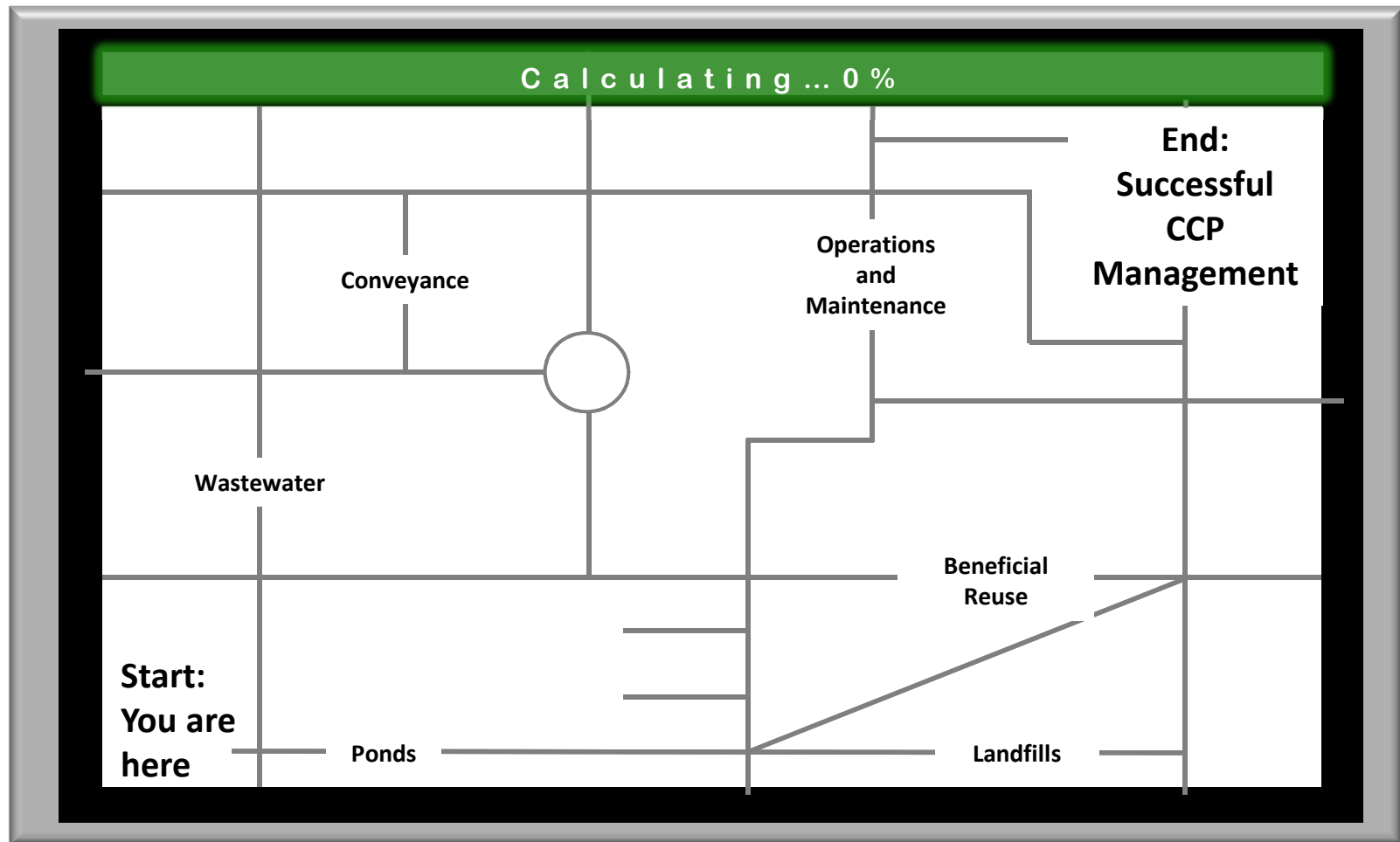
Presented by:

Mark Rokoff, PE

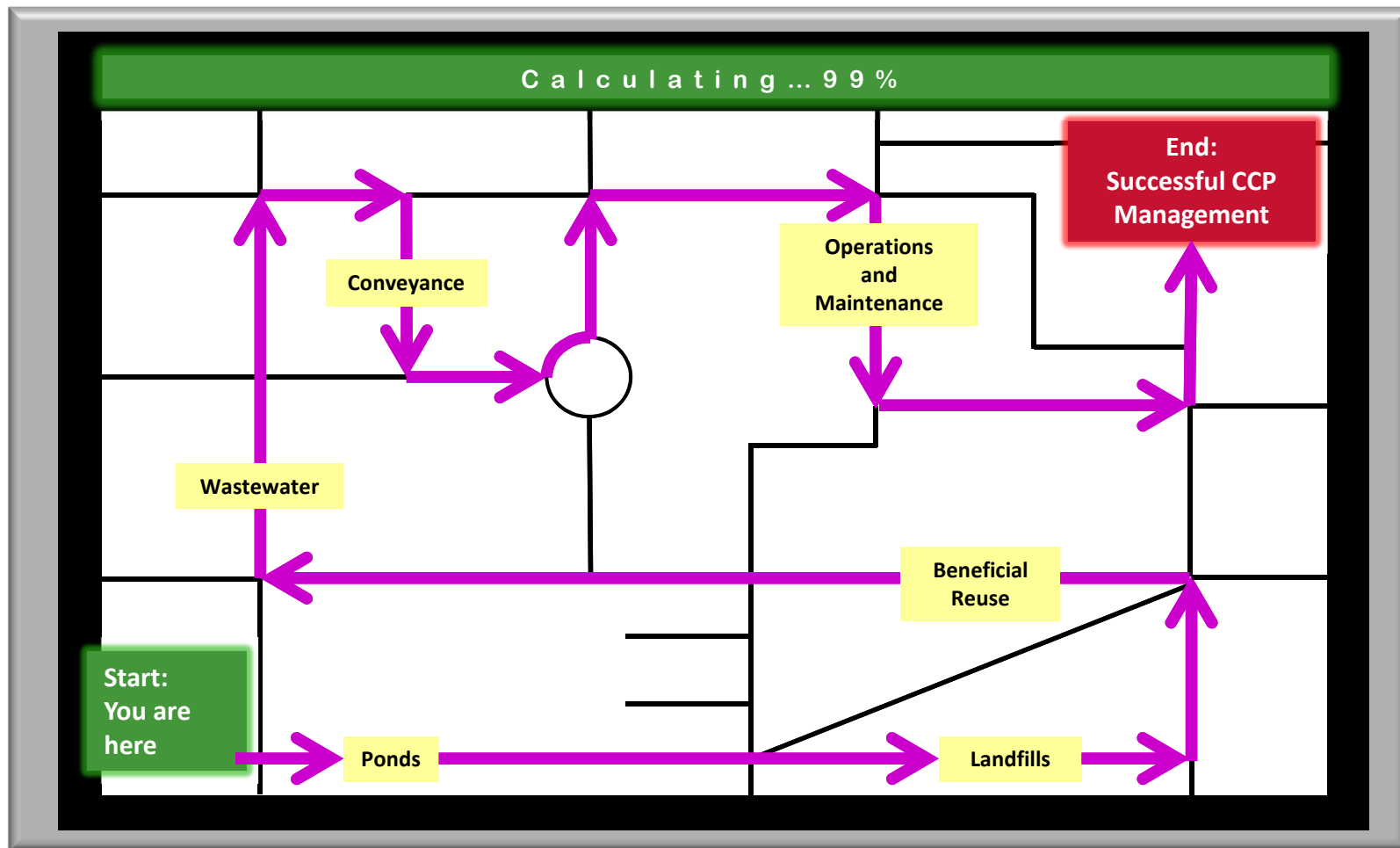
National CCP Management Practice Lead

June 26 , 2014

Managing CCP in today's market is not easy to map!

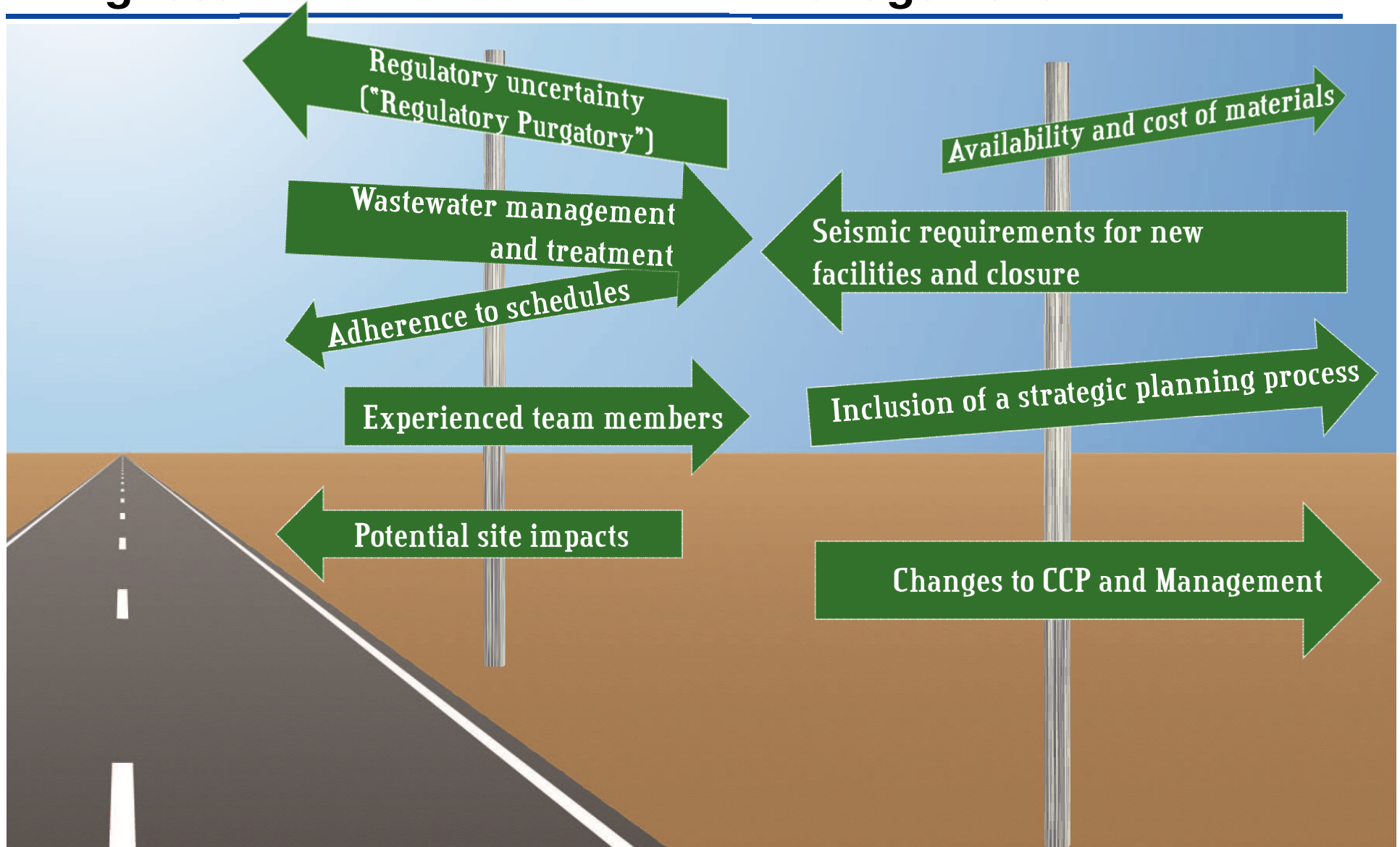


Managing CCP in today's market is not easy to map!

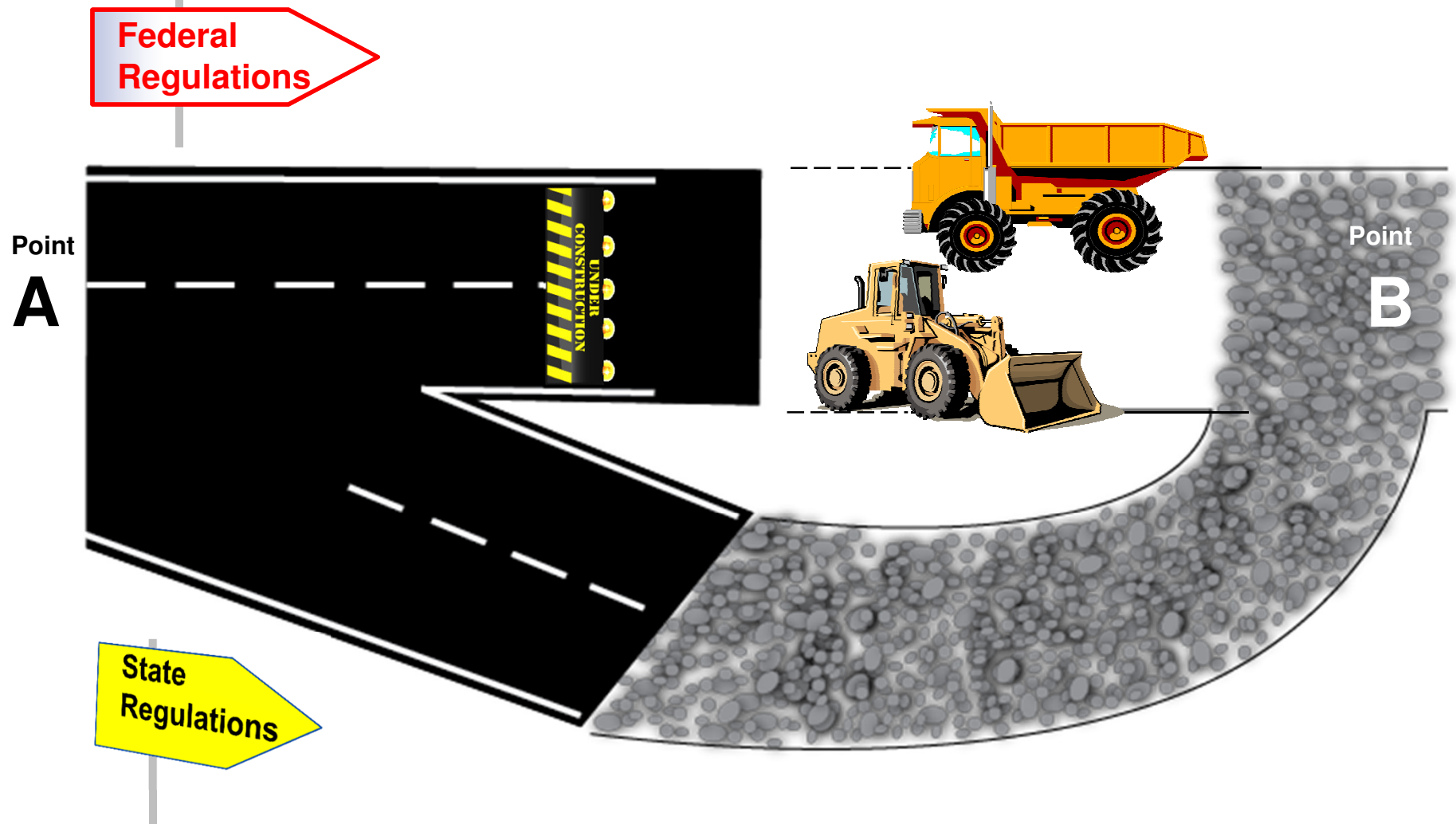


Presentation objective: Identify the challenges and suggest guidance to navigate the route to successful CCP management.

Highest Risks/Concerns in CCP Management



Regulatory Uncertainty (“Regulatory Purgatory”)



Regulatory Uncertainty (“Regulatory Purgatory”)

Where are we now for final federal CCR rules?

Early 2012 – Lisa Jackson assures that the EPA intends to finalize the rule in late 2012 (after completing a risk analysis of coal ash reuse in products)

January 18, 2012 – A coalition of 11 environmentalist groups announce their intent on suing the EPA (They argue that the EPA is ignoring a RCRA requirement to periodically review and revise its waste rules).

April 5, 2012 – The coalition filed the lawsuit to compel the U.S. Environmental Protection Agency (EPA) to regulate coal ash.

October 2012 - Suzanne Rudzinski Declaration (additional time to complete the CCR regulations...1 year...is needed)

September 30, 2013 – Court order to lawsuit says EPA has failed to review CCR Regulations as required (EPA had already agreed with this). EPA to provide a date for final rule.

January 29, 2013 – US EPA announces they will complete the CCR Rules by December 19, 2014

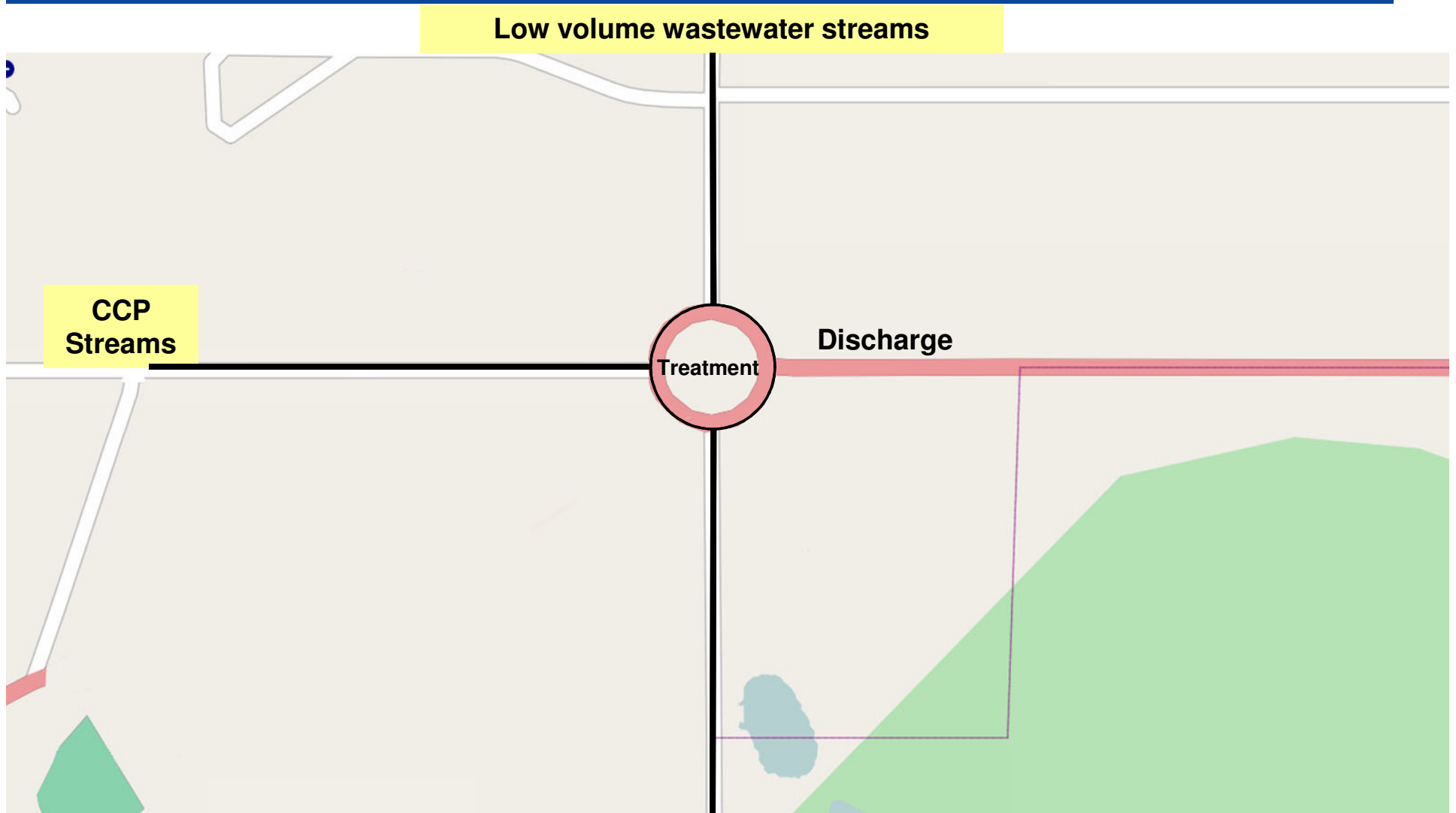
December 19, 2014 !

Regulatory Uncertainty (“Regulatory Purgatory”)

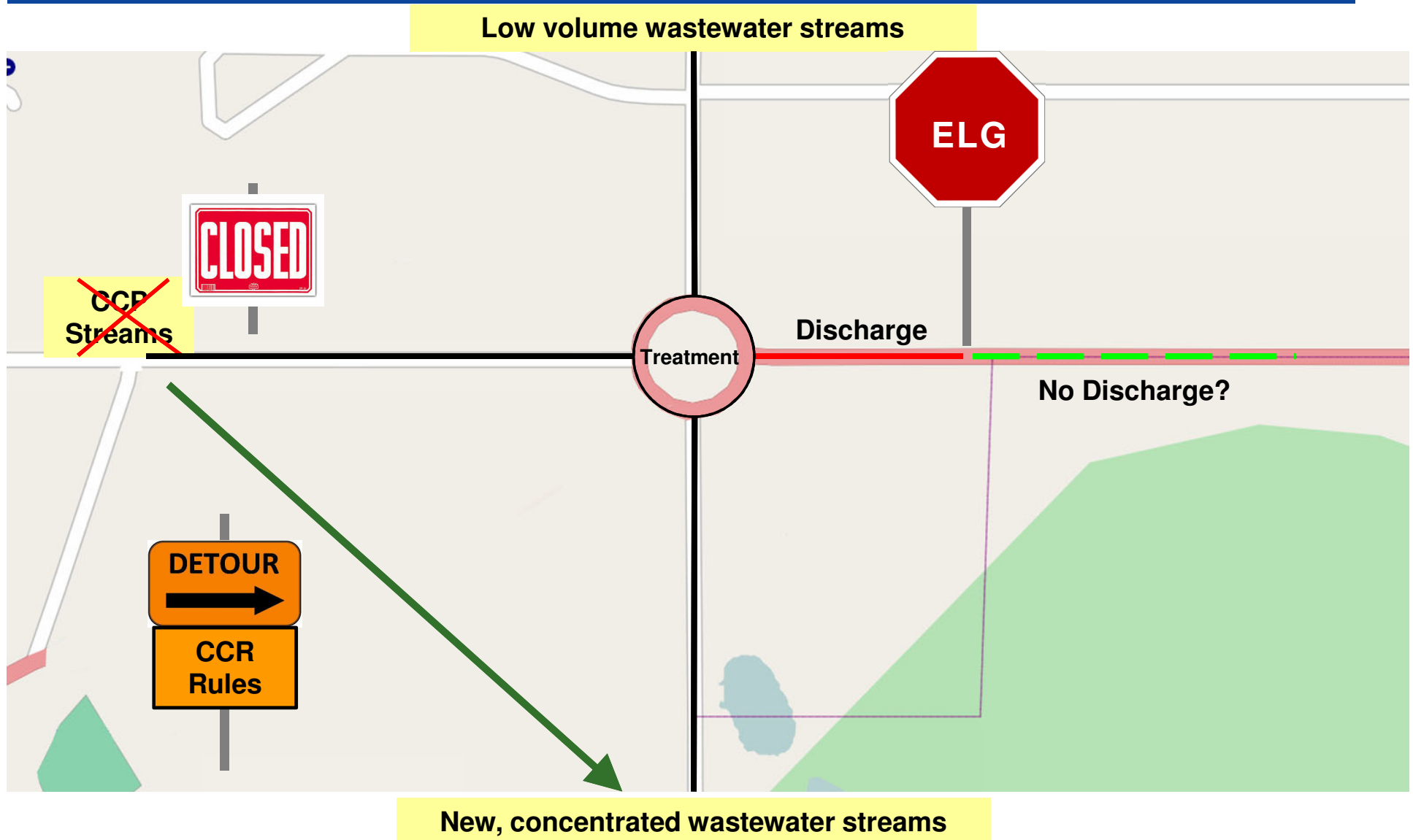
Solution

- **Understand and Evaluate the Risk (develop a regulatory approach)**
 - Develop conceptual plans (identify differences between state and proposed federal regulatory requirements; compare with industry standards)
 - Determine the impact to the project
 - Develop an approach to discuss with the regulatory agencies (based on prioritization)
- **Communicate (negotiate) with Regulating Agencies**
 - Understand key triggers
 - Understand schedule constraints
 - Understand the regulatory framework that the action will be carried out through (e.g., NPDES)

Wastewater Management and Treatment



Wastewater Management and Treatment



Consider all the Options (Existing)

Table Legend:
EPA “preferred” options noted in red.
 T = Treatment Technology and L = Limits




Increasing Pollutant Reduction

	Option 1	Option 3a	Option 2	Option 3b	Option 3	Option 4a	Option 4	Option 5
FGD Wastewater	Chemical precipitation (CP) ^a	Best Professional Judgment (BPJ) determination	CP ^a and biological treatment (BT)	T: CP ^a and BT for facilities ≥ 2000 MW scrubbed capacity; BPJ determination <2000 MW L: Hg, As, Se and nitrate-nitrite ≥ 2000 MW scrubbed capacity; BPJ determination <2000 MW	T: CP ^a and BT L: Hg, As, Se and nitrate-nitrite	T: CP ^a and BT L: Hg, As, Se and nitrate-nitrite	CP ^a and BT	CP and vapor compression evaporation (VCE)
Fly Ash Transport Water	Impoundment (equal to BPT)	T: Dry handling L: Zero discharge	Impoundment (equal to BPT)	T: Dry handling ^b L: Zero discharge	T: Dry handling ^b L: Zero discharge	T: Dry handling ^b L: Zero discharge	T: Dry handling L: Zero discharge	T: Dry handling L: Zero discharge
Bottom Ash Transport Water	Impoundment (equal to BPT)	T: Impoundment L: Equal to BPT	Impoundment (equal to BPT)	T: Impoundment L: Equal to BPT	T: Impoundment L: Equal to BPT	T: Dry handling/ closed loop ^c for units >400 MW; Impoundment ≤	Dry handling/ closed loop ^c	Dry handling/ closed loop ^c
Combustion Residual Leachate	Impoundment (equal to BPT)	T: Impoundment L: Equal to BPT					CP ^a	CP ^a
FGMC Wastewater	Impoundment (equal to BPT)	T: Dry handling L: Zero discharge					T: Dry handling L: Zero discharge	T: Dry handling L: Zero discharge
Gasification Wastewater	VCE	T: VCE L: Hg, As, Se, TDS		L: Hg, As, Se, TDS	L: Hg, As, Se, TDS	L: Hg, As, Se, TDS	VCE	VCE
Nonchemical Metal Cleaning Wastes	CP	T: CP L: Cu, Fe	CP	T: CP L: Cu, Fe	T: CP L: Cu, Fe	T: CP L: Cu, Fe	CP	CP

- Draft rule is released June 2013
 - Complex matrix of options
 - Comment format
- Unclear of the final approach
- Final rule released ~~May 2014 (?)~~
Now September 2015

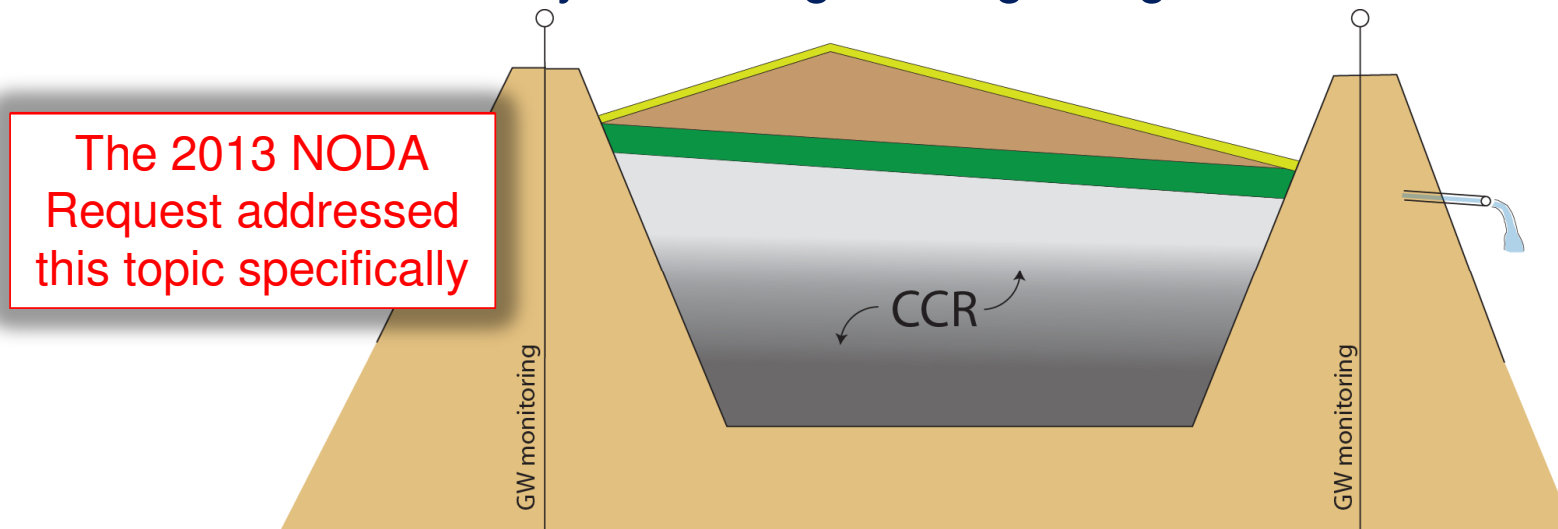
Consider all the Options (Existing) – EPA Preferred

Increasing Pollutant Reduction

	Current Conditions	Option 3a	Option 3b	Option 3	Option 4a
FGD Wastewater (including gypsum wash water)	Included as Low Volume Wastes T = Impoundment L: TSS & Oil and Grease	BPJ determination (technology and limits)	T: Chemical Precipitation(CP) ^a and Biological Treatment (BT) for facilities ≥ 2000 MW scrubbed capacity; BPJ determination <2000 MW L: Hg, As, Se and nitrate-nitrite ≥ 2000 MW scrubbed capacity; BPJ determination <2000 MW	T: CP ^a and BT L: Hg, As, Se and nitrate-nitrite 	
Fly Ash Transport Water	T: Impoundment L: TSS & Oil and Grease	T: Dry handling ^b L: Zero discharge 			
Bottom Ash Transport Water	T: Impoundment L: TSS & Oil and Grease	T: Impoundment L: Equal to BPT (no change from current rule)			T: Dry handling/ closed loop ^c for units >400 MW; Impoundment ≤ 400 MW L: Zero discharge for units >400 MW; Equal to BPT ≤ 400 MW
Coal Combustion Residual Leachate	Included as Low Volume Wastes T = Impoundment L: TSS & Oil and Grease	 T: Impoundment L: Equal to BPT (no change from current rule)			No longer regulated as low volume wastes

Impact of the CCR Rules – Focus on Pond Closures

- According to the draft CCR Regulations, ponds to begin closure 30 days after ceasing the receipt of CCRs and complete closure within 180 days.
 - “The owner or operator of the...surface impoundment must begin closure activities no later than 30 days after the date on which the CCR landfill or surface impoundment receives the known final receipt of CCR”
 - “The owner or operator of the CCR...surface impoundment must complete closure activities in accordance with the closure plan within 180 days following the beginning of closure...”



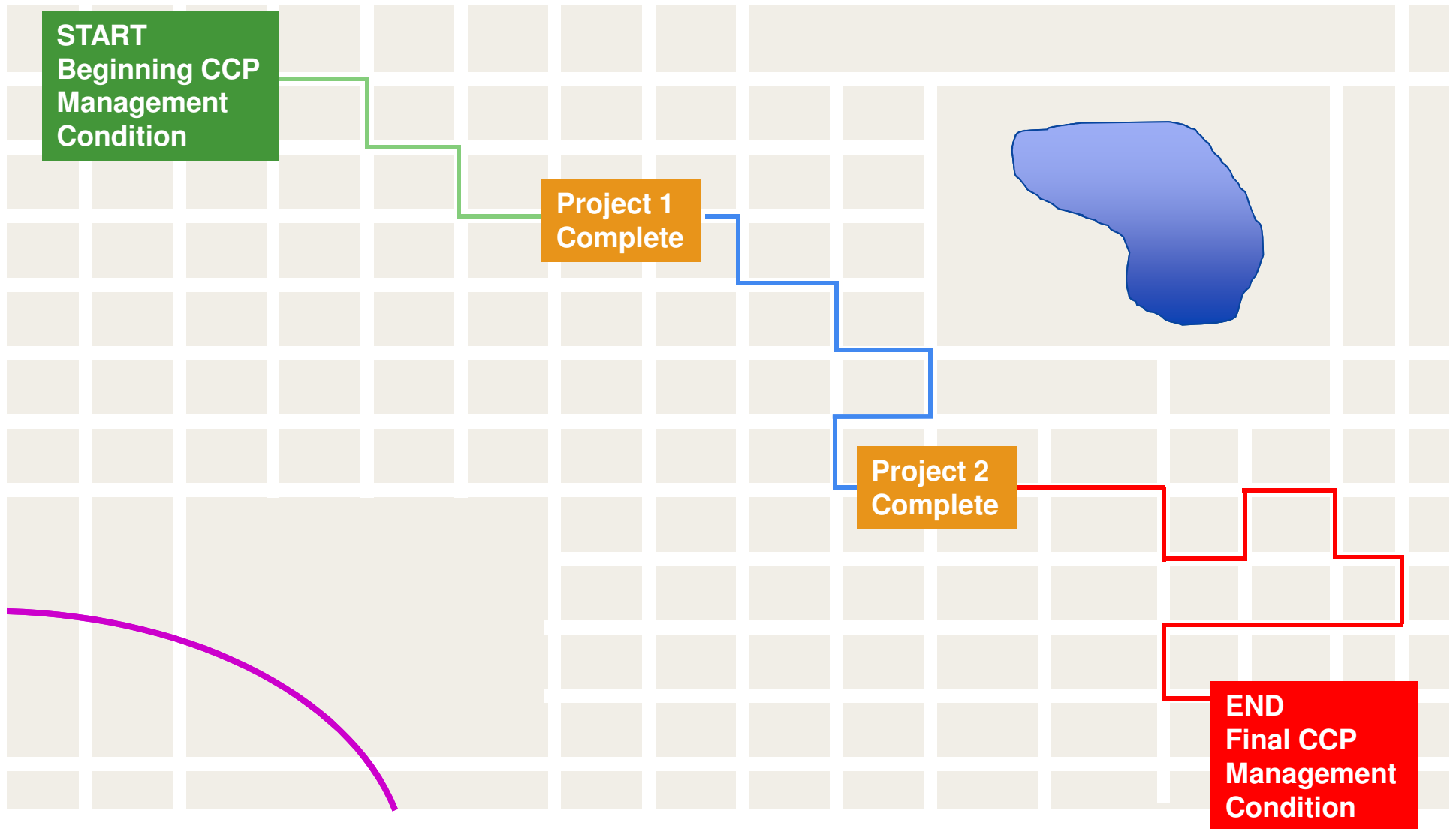
Wastewater management and treatment

Solution

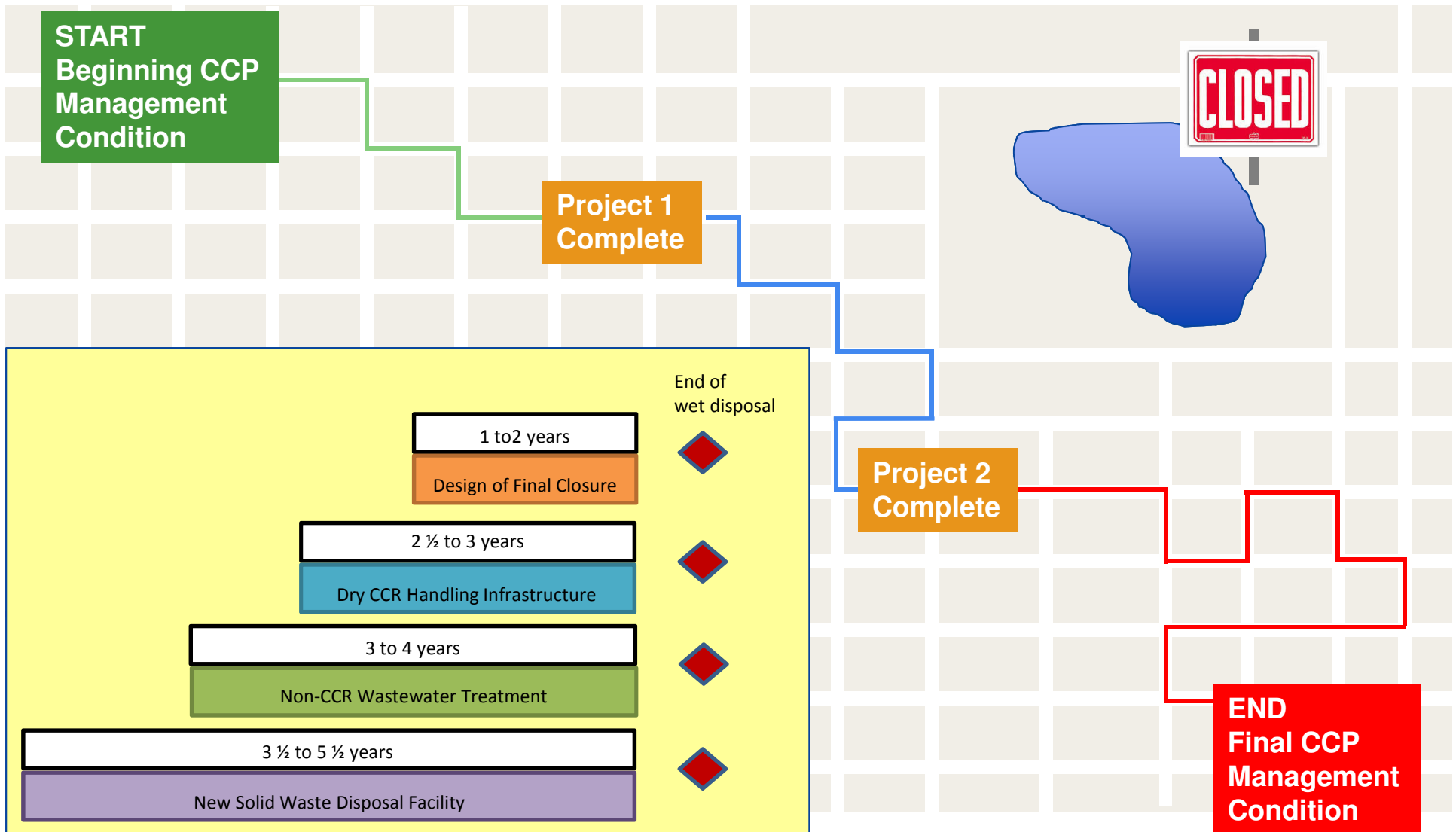
- **Include wastewater treatment approach in overall CCP program**
 - An initial assessment of all (existing and new) wastewater streams
 - Develop evaluation of treatment alternatives and select
 - Include these results into overall plant project schedules
- **Regulatory drivers (ELG) may impact overall approach**
 - Result in pond closure(s) and/or revisions to CCP Management practices



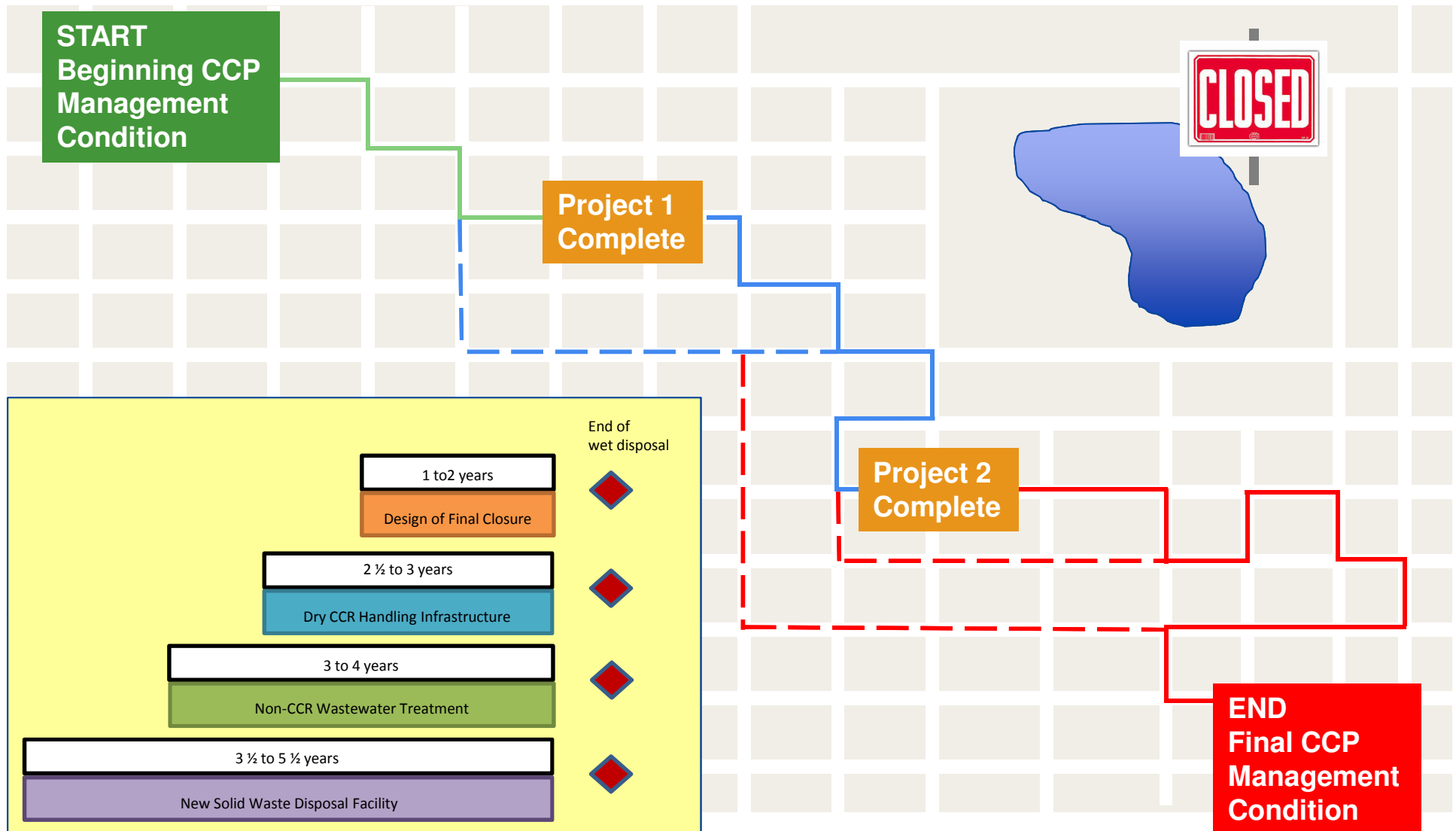
Adherence to schedules (project, permitting, construction, etc.)



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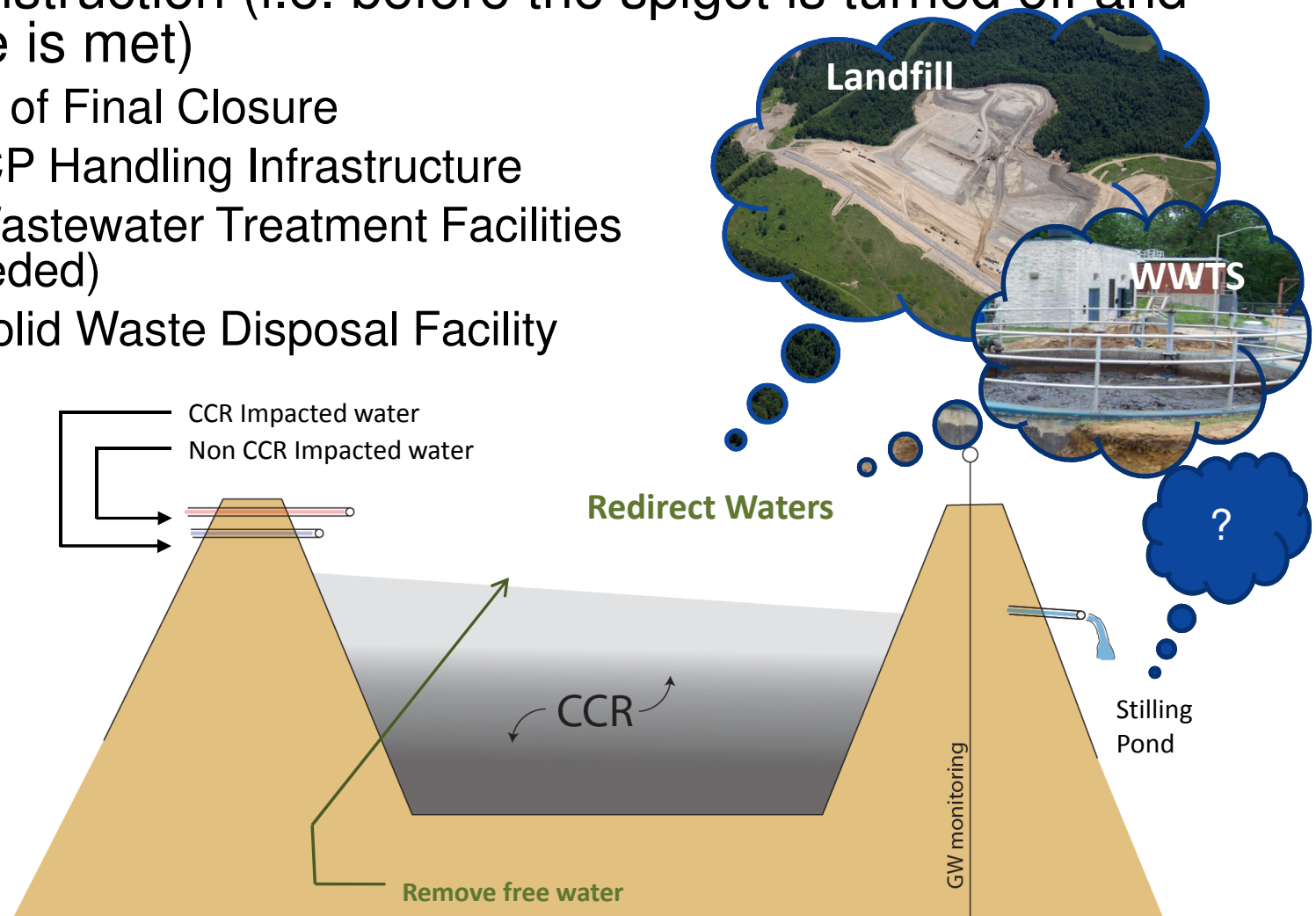


Adherence to schedules (project, permitting, construction, etc.)



Understanding Schedule Constraints

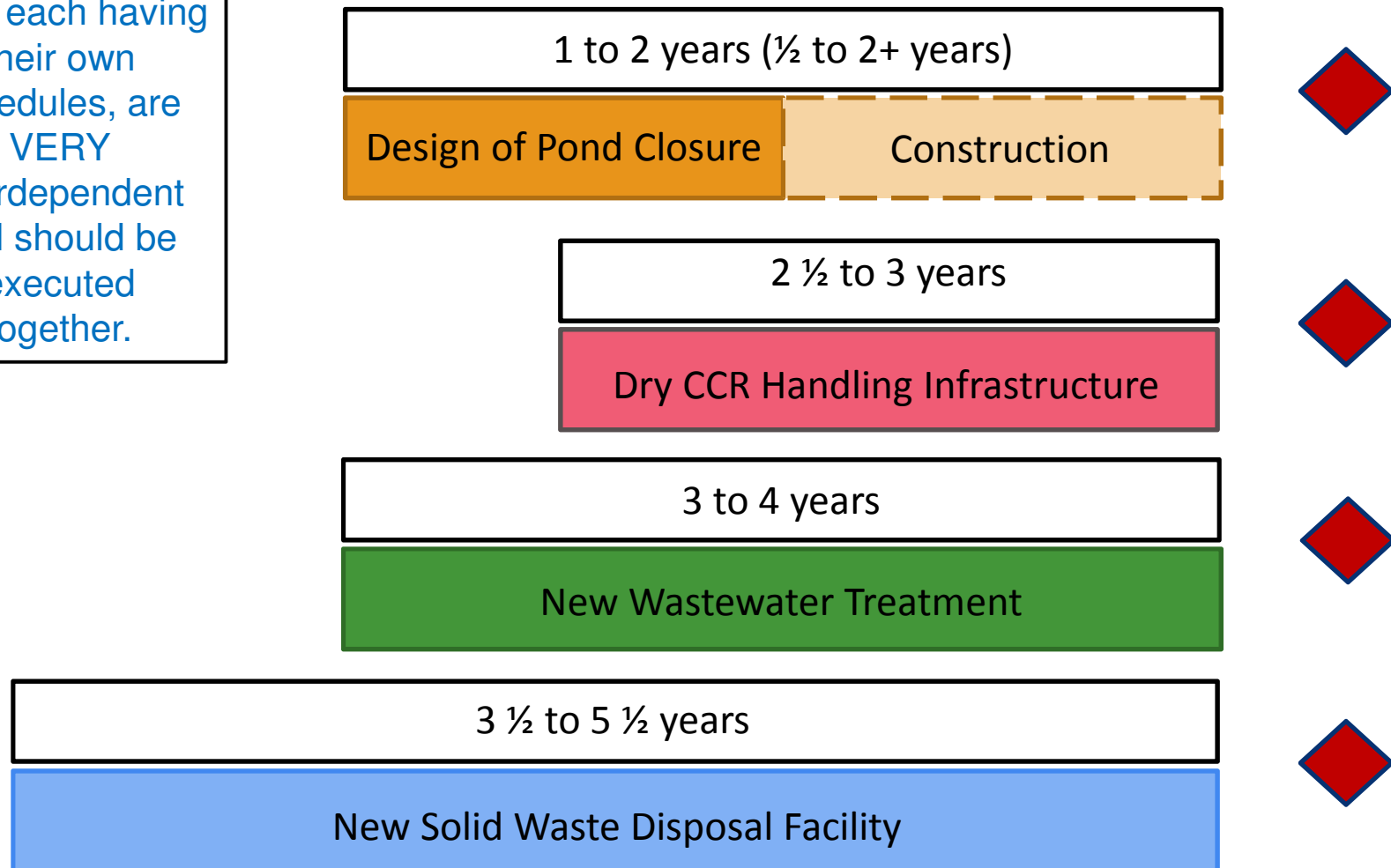
- The following may be needed prior to the start of final closure construction (i.e. before the spigot is turned off and compliance is met)
 - Design of Final Closure
 - Dry CCP Handling Infrastructure
 - New Wastewater Treatment Facilities (as needed)
 - New Solid Waste Disposal Facility



Overall Dry CCR Conversion/Pond Closure Process

These tasks, while each having their own schedules, are VERY interdependent and should be executed together.

End of wet disposal



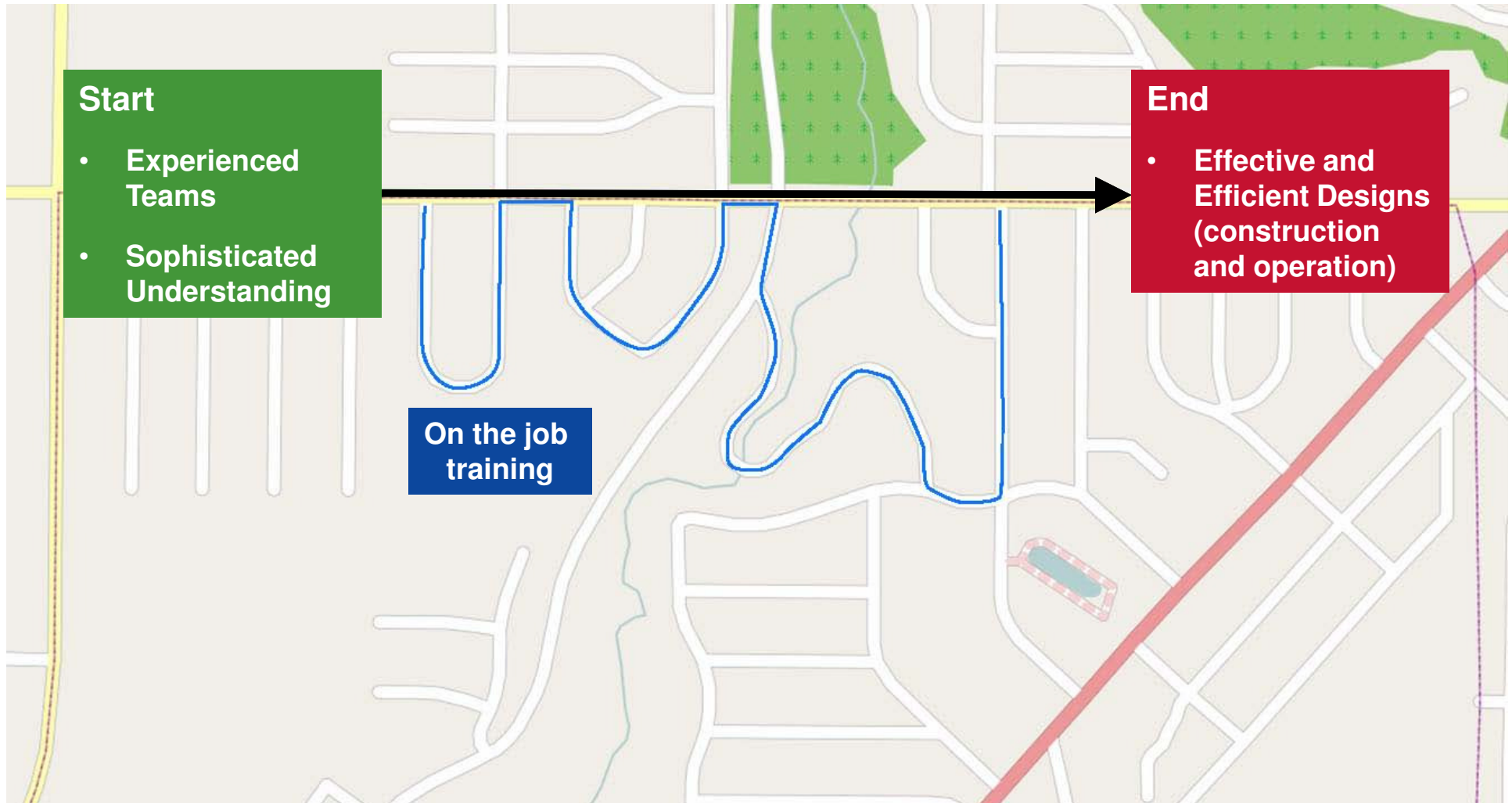
Adherence to schedules (project, permitting, construction, etc.)

Solution

- Early development of project schedules that include key elements of adjacent projects (create a master/program schedule)
- Involvement of regulatory authorities to identify “hard spots” and possible rule exemption requests
- Regular schedule meetings to check progress and enforce milestones
- Early start on projects...**DON'T WAIT TILL THE LAST MINUTE**

TASK	2015	2016	2017	2018	2019	2020	2021	2022	2023
CCP PLACEMENT									
PHASE 1 FINAL COVER									
PHASE 2 FINAL COVER									
PHASE 3 FINAL COVER									
PHASE 4 FINAL COVER									
PHASE 5 FINAL COVER									
PHASE 6 FINAL COVER									
PHASE 7 FINAL COVER									

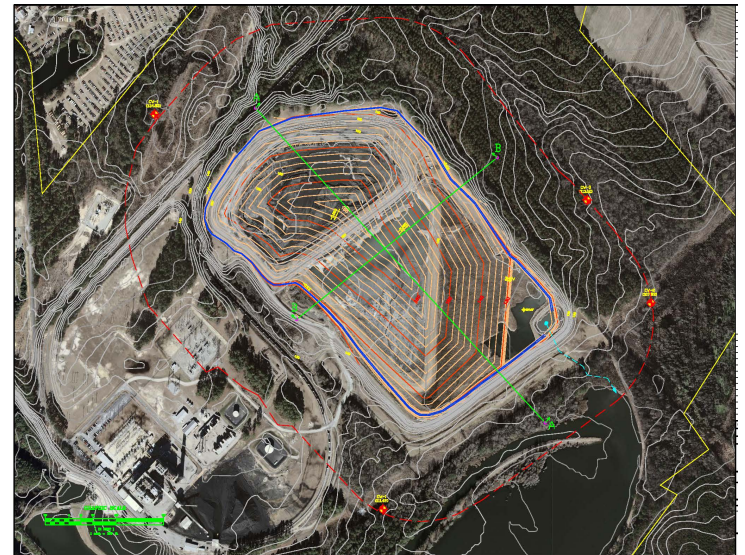
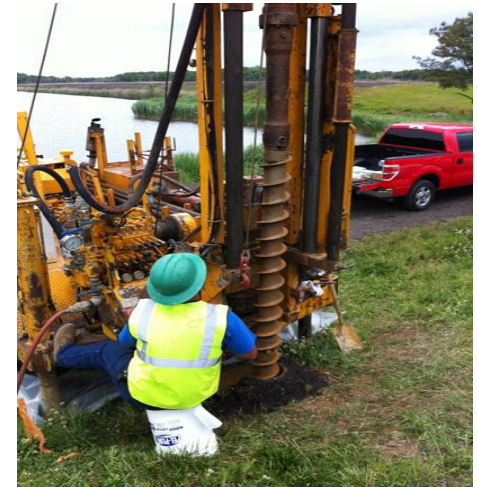
Experienced Team Members (engineering, consultant, construction, contractors, etc.)



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Fully Integrated Understanding of ALL Issues:

- Pond/Landfill design/closure
- Understanding site conditions (sampling and testing)
- Spillway structures (overall performance and stability)
- Legacy site issues (seepage, stability, etc.)
- Groundwater monitoring/modeling
- Surface water management
- Operational procedures (emergency plans)
- Regulatory framework (CCR, MATS, ELG, etc.)
- Process engineering / Dewatering /Conversion
- Conveyance and infrastructure
- Plant future (closure, conversion to gas, etc.)
- ...and more!



Experienced Team Members (engineering, consultant, construction, contractors, etc.)

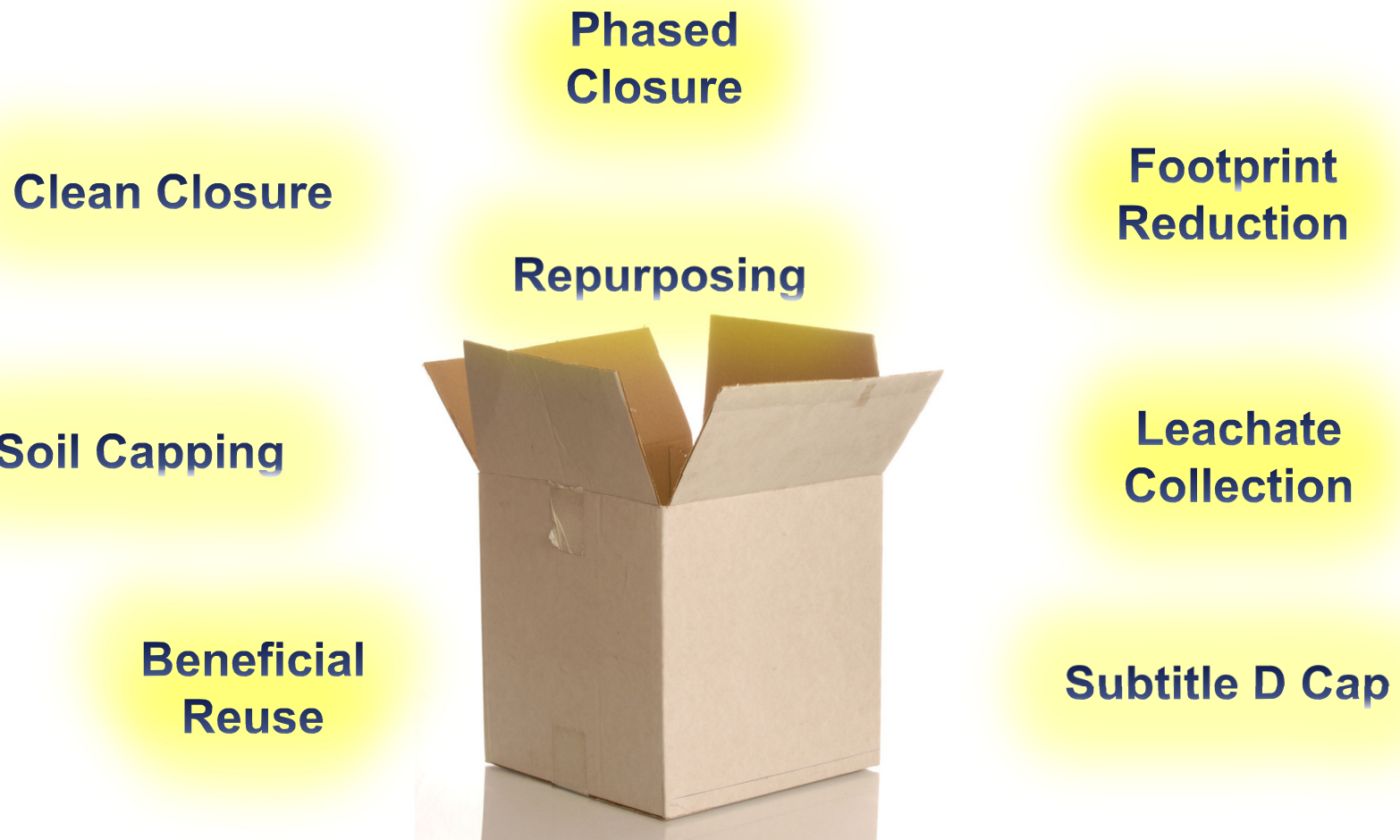
Solving Legacy Site Issues:

- Operational changes
 - Pond lowering
 - Internal ditching/Piping
- Hydraulic structures
- Long-term monitoring
- Dike reconfiguring
 - Slope flattening
 - Internal slope buildup
- Buttressing
- Reverse Graded Filters
- Capping



Understand
long-term
impacts of
solutions

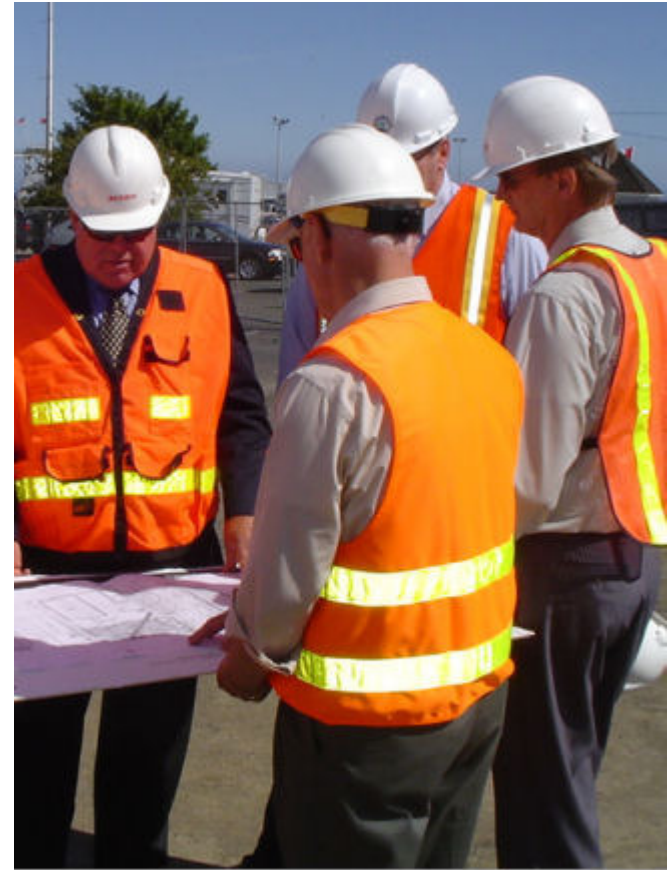
Experienced Team Members (engineering, consultant, construction, contractors, etc.)



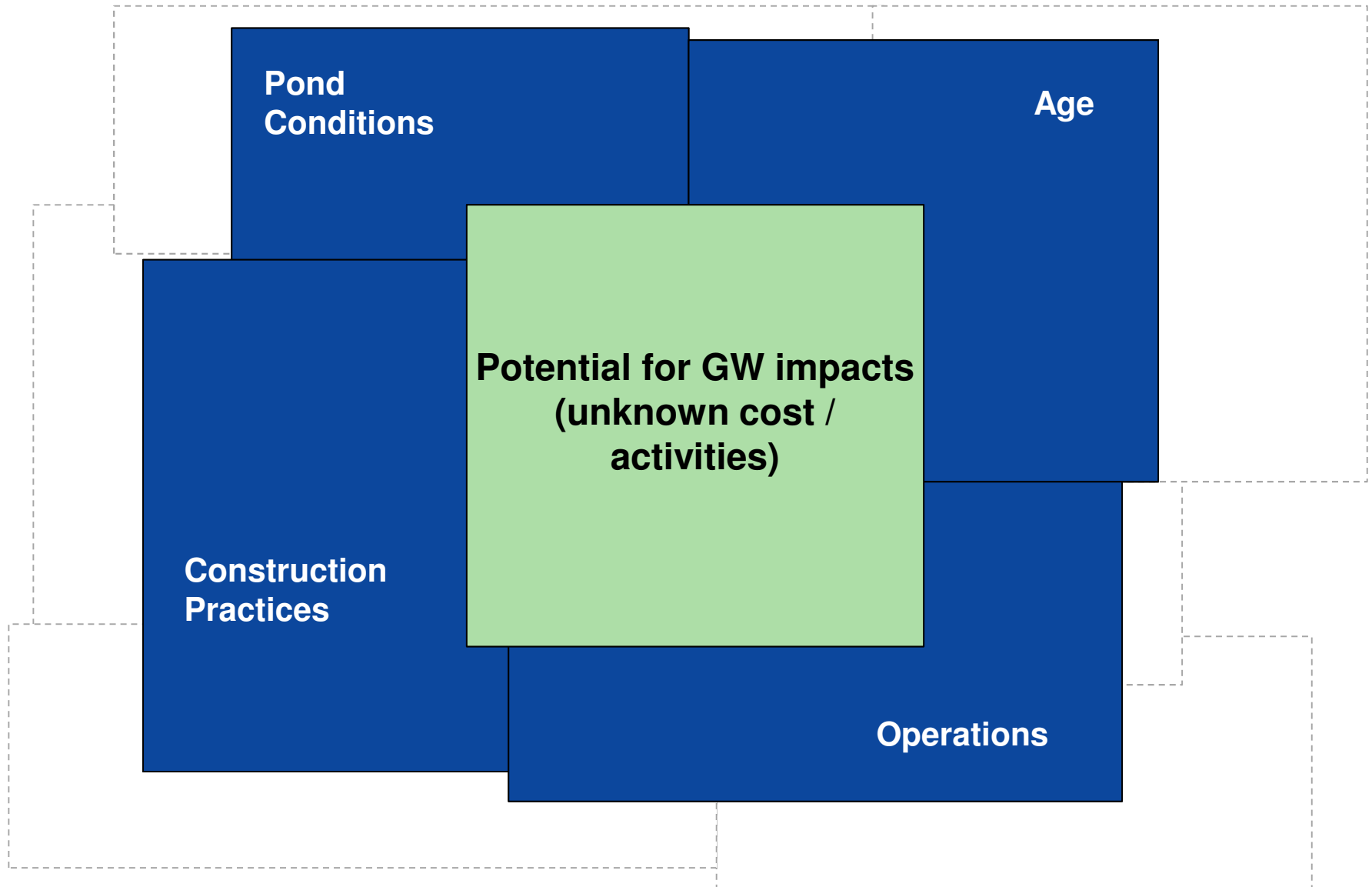
Experienced Team Members (engineering, consultant, construction, contractors, etc.)

Solution

- Select team members with demonstrated experience and expertise to avoid issues
- Consider combining related projects and have one team
- Consider selecting a smaller number of qualified consultants to manage a collection of like projects (identify a lead consultant)
- Consider teams with strong relationships with regulatory agencies



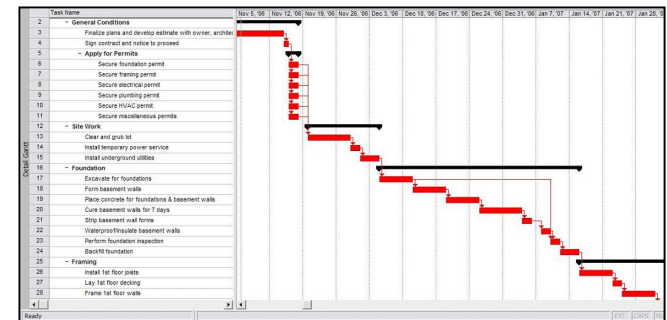
Potential Site Impacts (to Groundwater)



Potential Site Impacts (to Groundwater)

Solution

- **Understand potential impacts to better prepare & manage**
 - Project budgets
 - Project schedules
 - Regulatory involvement/acceptance
- **Execute a strategic planning approach**
 - Multi-phased approaches that anticipates possible outcomes
 - Implement evaluation phase prior to investigations
- **Seek a balance between risk management and project development**

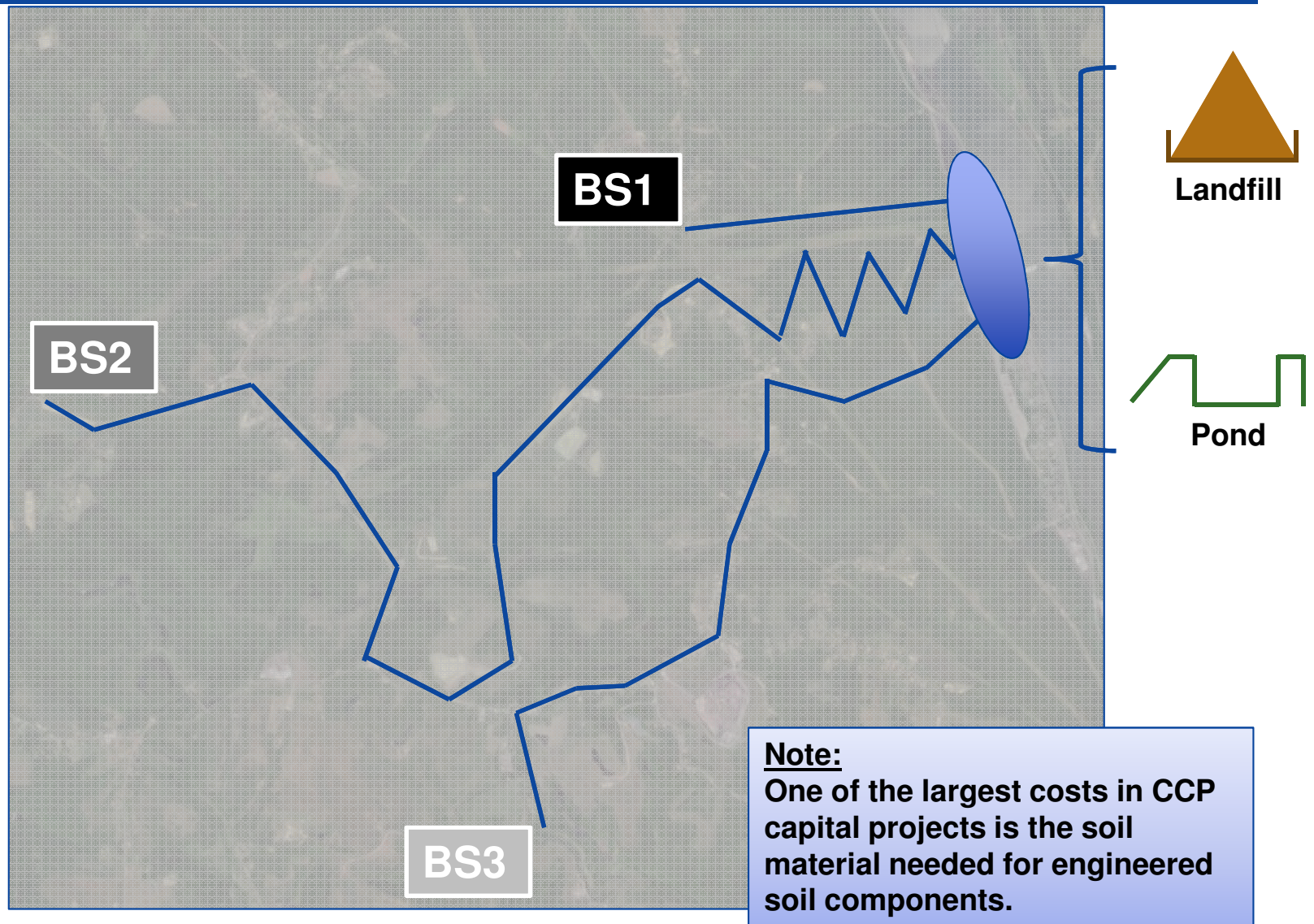


Availability and Cost of Materials (borrow soils)

Borrow Source Factors:



Transportation



Availability and Cost of Materials (borrow soils)

Solution

- **Consider alternate materials where cost and performance factors favor the approach**
 - Beneficially reusing CCP materials (review existing precedents)
 - Geosynthetics to replace engineered components
- **Consider methods to reduce soil needs**
- **Early evaluation of potential borrow sources (and secure properties)**
 - Consider quality, availability, and transportation distance
 - Consider mining and processing of on-site soft bedrock for certain soil needs

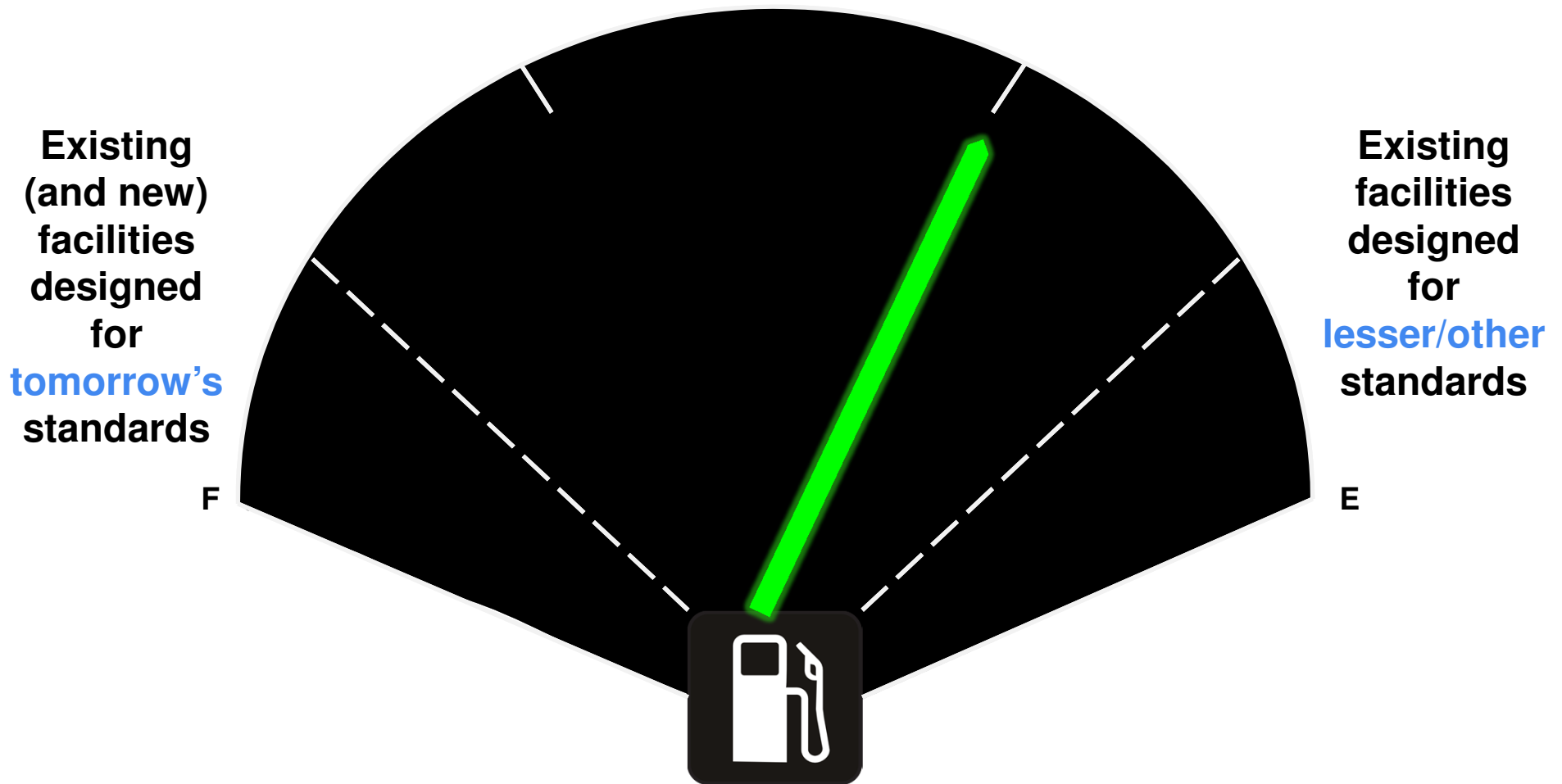


280,000 CY+
for a 2% slope

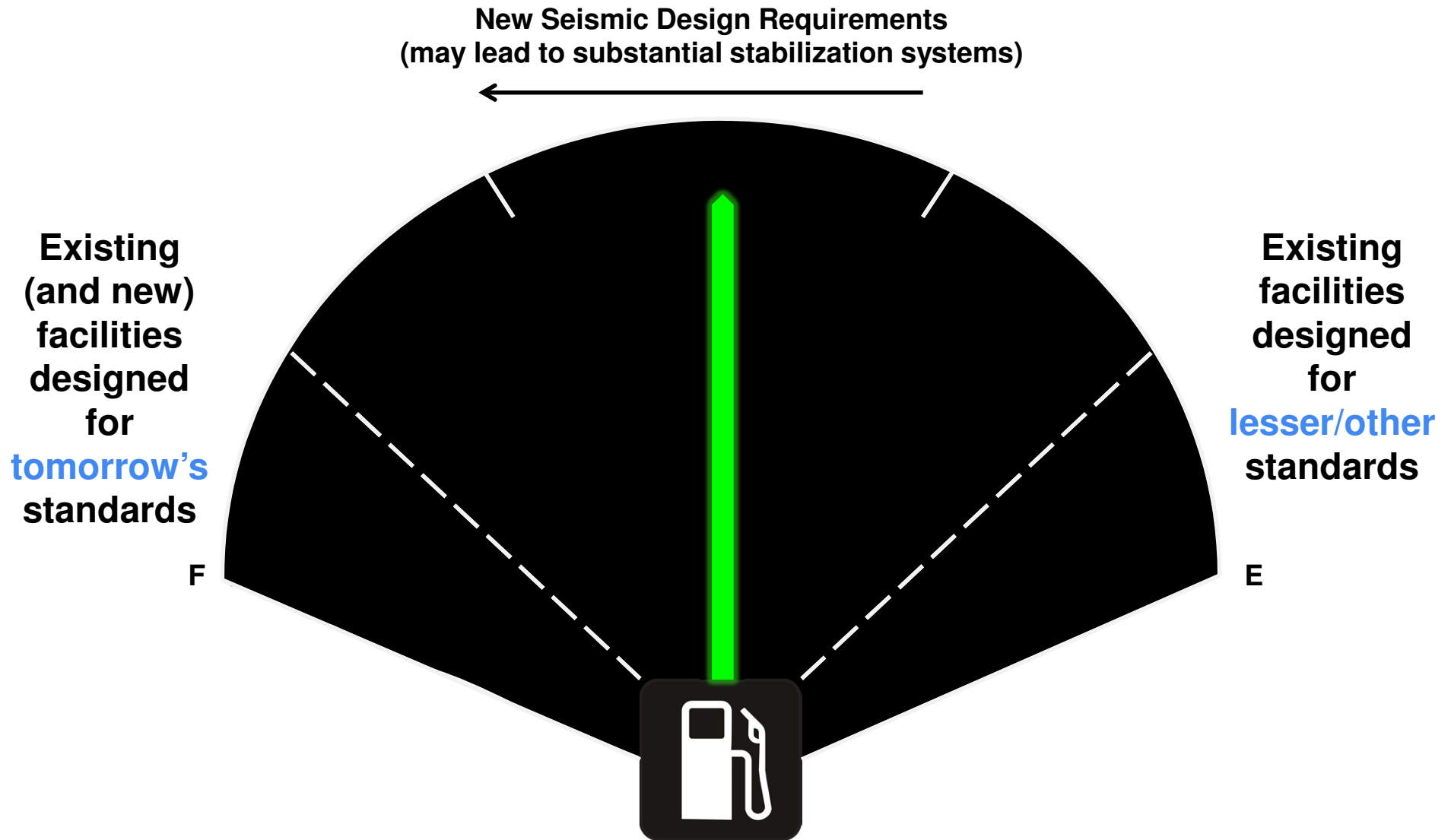


20,000 trucks

Seismic Requirements for New Facilities and Closure



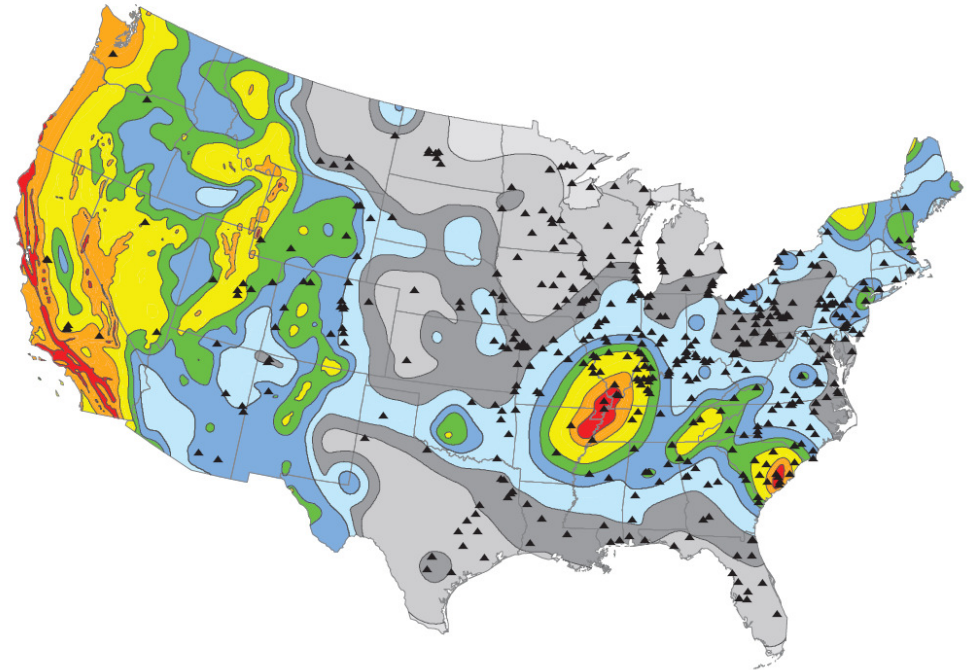
Seismic Requirements for New Facilities and Closure



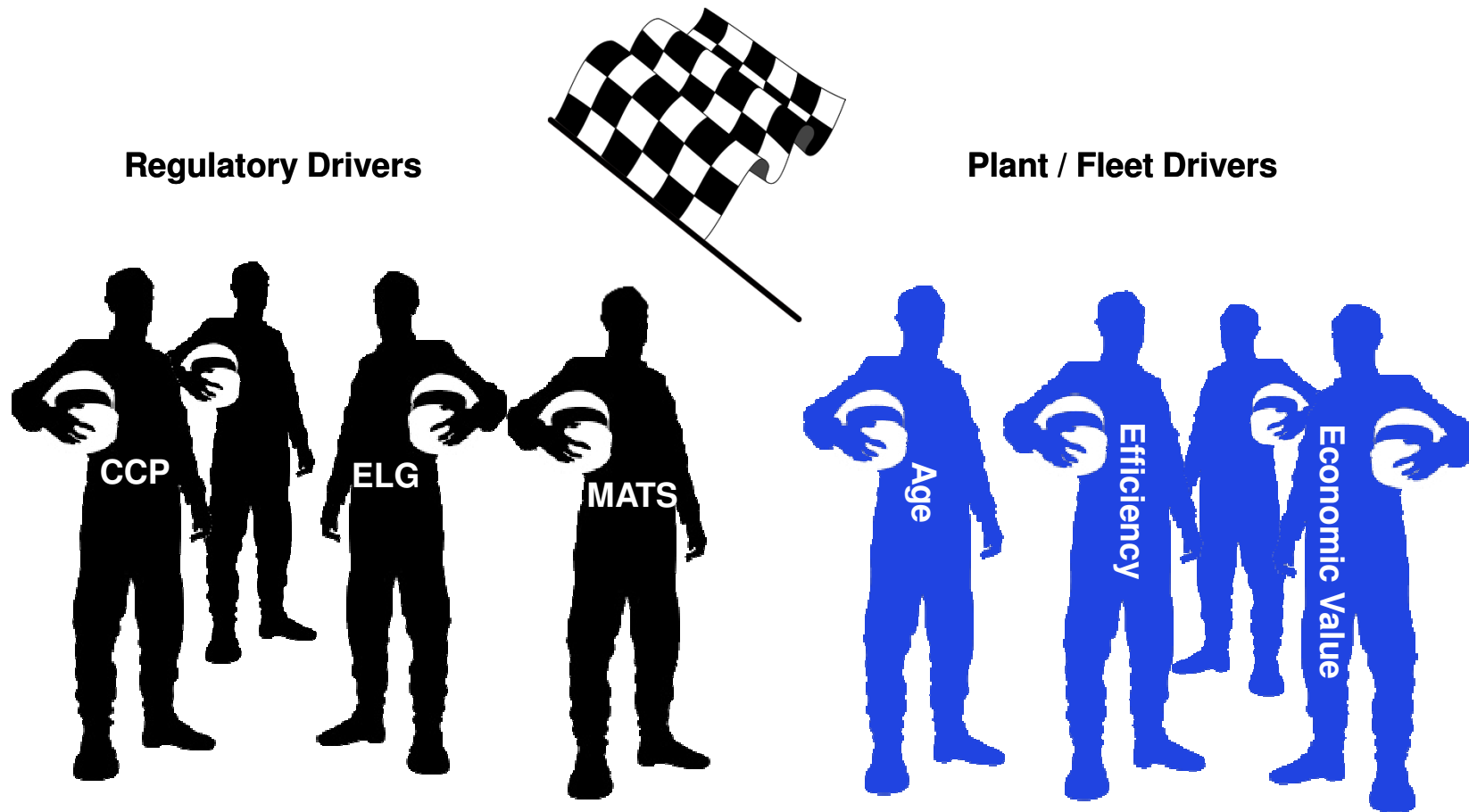
Seismic Requirements for New Facilities and Closure

Solution

- **Multi-phased approach to understand impact to overall project**
- **As needed, conduct site-specific seismic engineering evaluations to reduce seismic factors**
- **Seek innovative and cost effective solutions**



Inclusion of a Strategic Planning Process



Complex Planning Process - - > Make informed decisions

Inclusion of a Strategic Planning Process

Solution

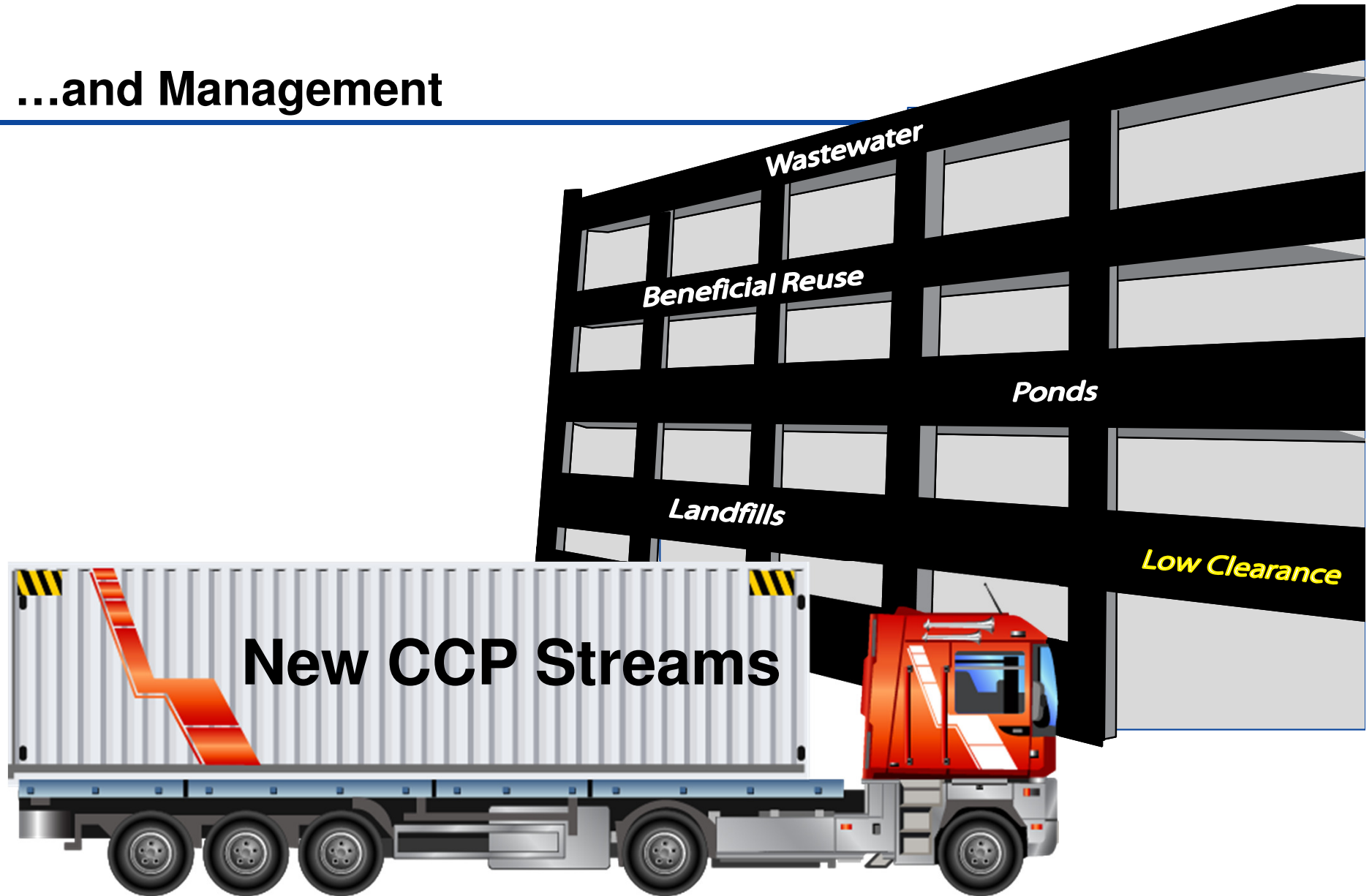
- **Conduct Strategic Planning**
- **Develop an understanding of all project milestones and intersection points**
 - Define the project scope and approach
 - Establish schedule milestones (including permitting) and predecessor activities
 - Estimate costs/cash flows
- **Regularly discuss project status, changes, etc. (impact of related drivers)**
- **Involve regulatory authorities in strategic decisions**



Changes to CCP...



...and Management



Changes to CCP...and Management

Solution

- **Identify possible changes and explore outcomes**
 - Impacts to the CCP streams characteristics
 - Evaluate management practices and the impact of changes
 - Beneficial reuse
 - Disposal source elimination
- **Execute bench scale and field scale testing**
- **Explore all options**





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