

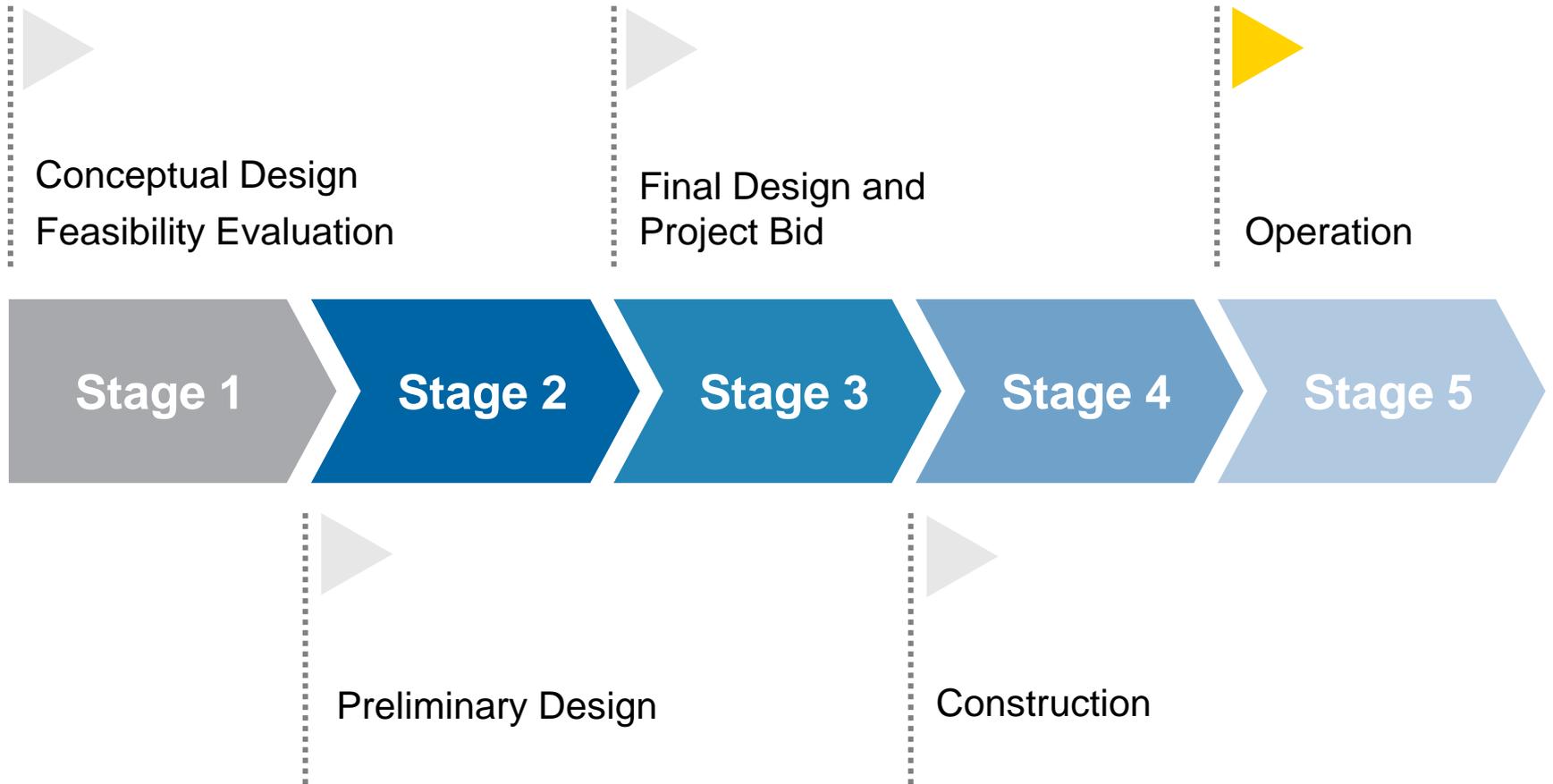
Smart Expansion: the benefits of integrating environmental planning into engineering projects

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Project life cycle



Compliance is increasingly complicated

- Environmental regulations are ever evolving
 - State-to-state variation
- Increasing number of jurisdictions exceeding regulatory standards
 - Aging infrastructure
 - Increasing water pollution
 - Many areas of the Midwest barely meet ambient air quality standards
- Environmental is increasingly short-staffed
 - Unemployment at historic lows
 - Science, technology, engineering and mathematics (STEM) shortage in the Midwest

When good projects go bad

- Cost efficient design is not synonymous with environmentally friendly
- Late stage project involvement potentially brings to light environmental issues after many project costs are already invested
- Rework can be costly
 - Potentially unusable equipment
 - Project delays can incur additional costs or delay production
 - Potential for a regulatory violation and fines
- Meeting environmental regulatory requirements may require additional unbudgeted funds which could have been allocated at the beginning
- Unanticipated consequences
 - Secondary containment built without sufficient containment for the largest container with necessary freeboard
 - An oil/water separator is directed to ground posing risk to soil/groundwater
 - A stack is too short for a facility to pass the air model at the permitting stage

What can be done?

- Make the case to yourself that capital projects are worth your time
- Make a business case to management to get involved early
 - Reduced rework
 - Better budgeting
 - Planning for future operation or facility expansion
 - Optimize sustainability
- Identify facility-specific environmental pain points
 - Facilities with more stringent state or local requirements
 - Facilities in areas where background emissions are very high
 - Facilities in areas without standard utilities (e.g. septic in lieu of sanitary)
 - Facilities that are landlocked, impacting the air modeling property boundary
- Identify facility-specific opportunities
- Identify project-specific concerns or opportunities

Environmental compliance is team sport

- Increased training for engineering/design/procurement
 - Understanding tradeoffs of project capital cost versus long term operational costs
 - Understanding how design choices potentially impact future facility expansions
 - Understanding inter-related environmental issues e.g. waste media generated by air pollution control equipment
 - Educating procurement on the impact of changing suppliers or substituting a product
- Empowering environmental champions
 - Non-environmental staff assigned some of the routine day to day tasks such as area inspections or daily equipment readings

Questions?

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