REINHOLD ENVIRONMENTAL Ltd.

2012 Coal to Gas Conversion Round Table & Expo Presentation

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Coal-Gas / PCUG Conference
Chattanooga, Tennessee

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Connecting Natural Gas Supply to a Power Plant

Identify major components affecting costs for planning, designing, and installing a new gas pipeline.

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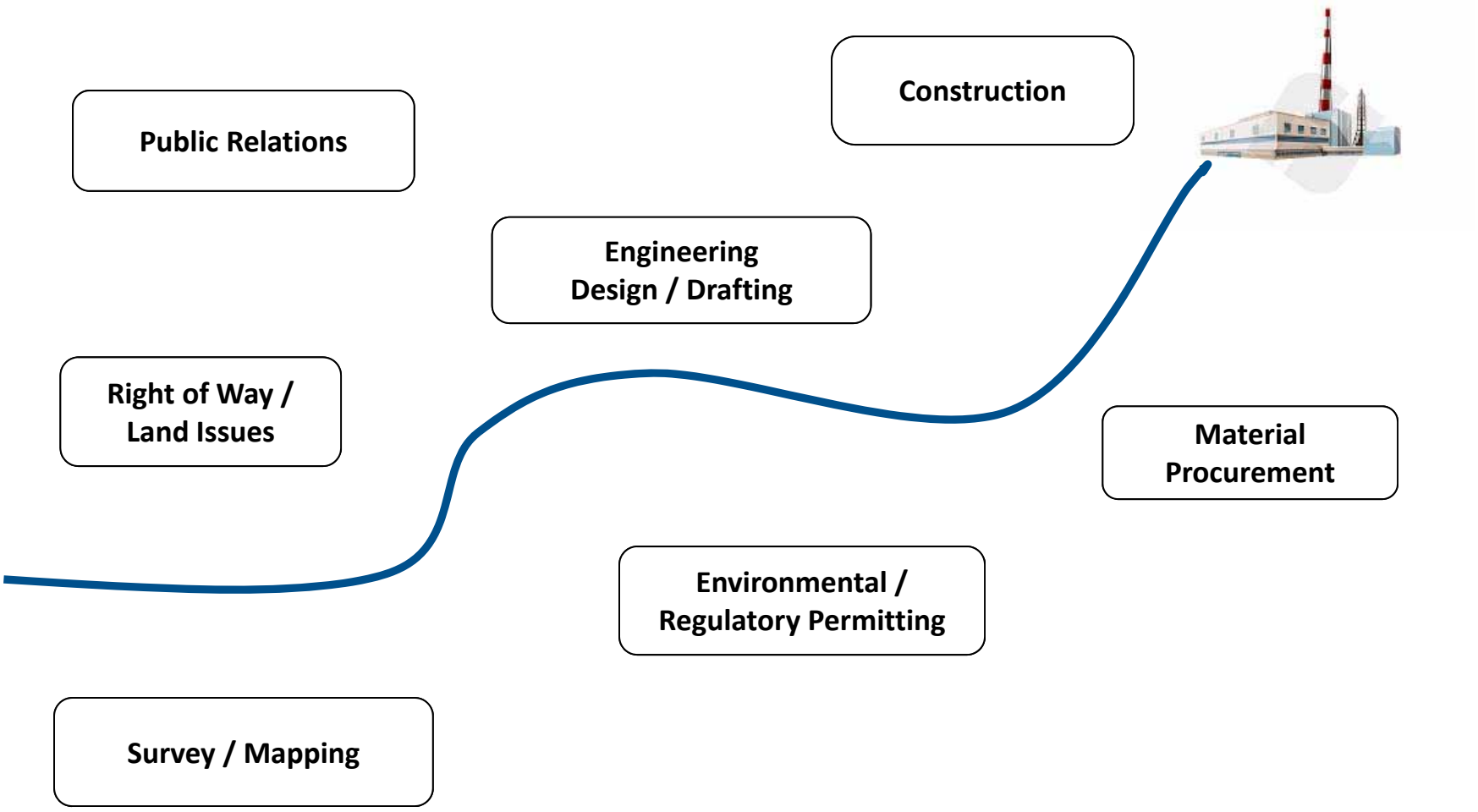
Put First Things First

- Failing to Plan is….. Planning to Fail!
- P-P-P-P-P
  - Proper
  - Planning
  - Prevents
  - Poor
  - Performance
- Begin with the end in mind

Components of Constructing a Pipeline



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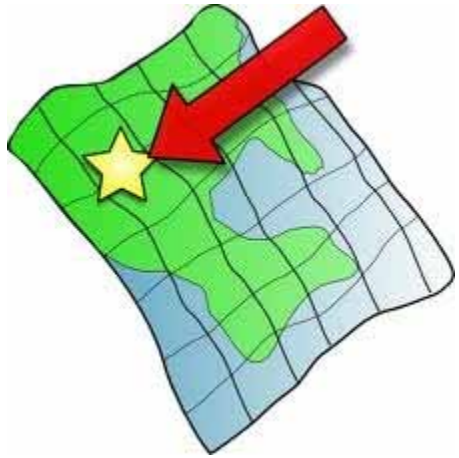
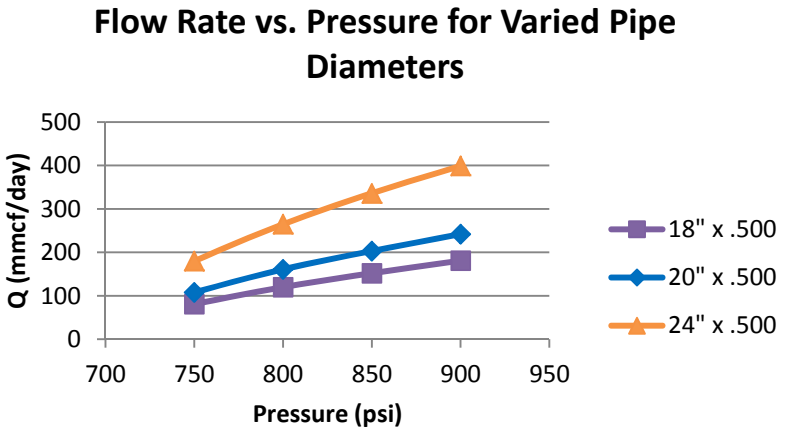
Project Planning….

- Determine Design Parameters
  - Volumes (maximum / minimum)
  - Pressures (maximum / minimum)
  - Distance from gas supply
  - Determine pipeline diameter
  - Metering and conditioning
- Table Top Evaluations
  - Route, Constructability Options
- Field Reconnaissance
- Identify Project Resources





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Route Selection / Alternatives (Co Location)

- Consider co-location with utilities
  - Transmission line corridors
  - Other gas companies

- Consider constructability of route
  - Terrain
  - Rock
  - Wetlands
  - Water crossings

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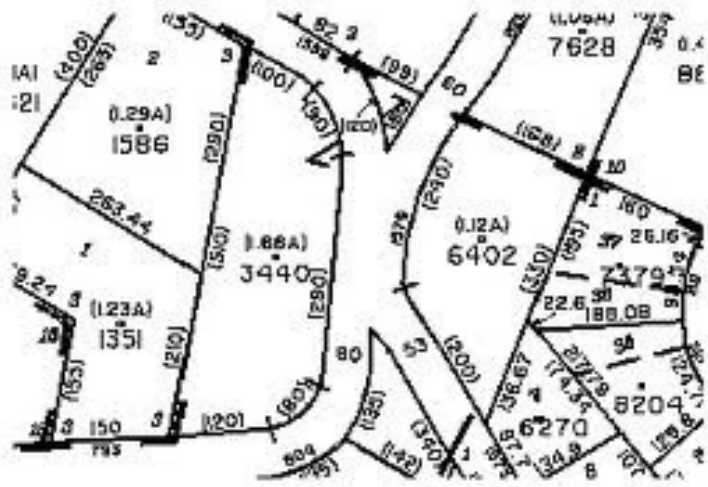
Route Selection / Alternatives

- Aerial Ortho Rectified Maps
  - This will help in preliminary route selections
- Consider effects on property owners.
  - How their property is crossed
  - Minimize construction near residential areas
- Consider environmental impacts
  - Threatened or endangered species
  - Archeological sites
- Knowledgeable Construction Person

Rights of Way

- Field Office(s)
- Ownership Line List
  - Courthouse / Title Work
- Training of Field Personnel
- Negotiations with Land Owners
  - Survey Permission
  - Land Rights Acquisition
  - Damages



Public Relations

- Meetings with Public Officials
  - Rule #1
- Public Open Houses
- Information Packages
- Landowner Meetings

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Civil Survey

- Consider electronic GPS survey
  - Property Boundaries
  - Wetland and Sensitive Areas
  - Weld tracking
  - As Built Documentation

- Have construction person with survey
  - Make route corrections during survey
  - Identify construction problems
  - Determine extra work spaces
  - Select access roads and warehouse sites

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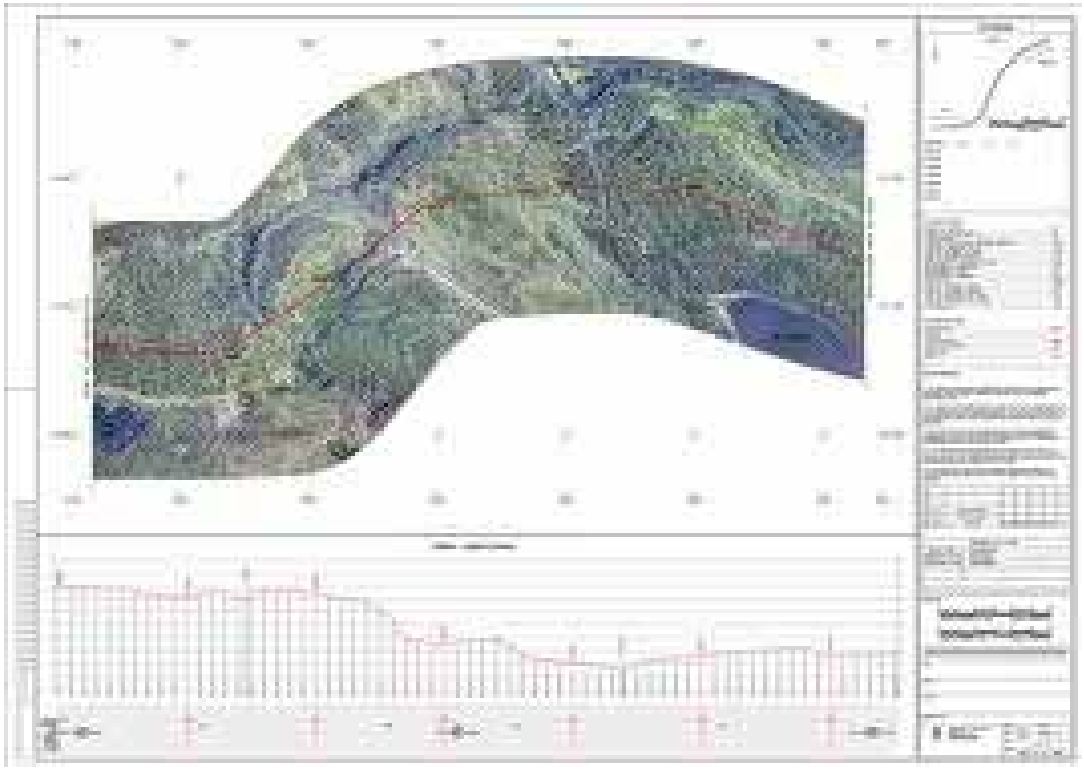
Environmental Survey

- Consider surveying a 300’ wide swath when doing environmental surveys.
  - This will give you room to move the pipeline if you have unforeseen construction problems.



Environmental Consultations

- Regulatory Agency Contacts
  - US Corps of Engineers
  - US Fish and Wildlife
  - Other local agencies
- Archeological Evaluations
- State Requirements

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Environmental (cont.)

- Endangered Species

Wetlands/Rivers & Creeks

- Wetlands
  - Environmental Mitigation
  - Extra work space for staging areas
  - Erosion Control
  - Special Construction Techniques
  - Restoration Alternative

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Construction Support

- Access to the Construction Corridor
  - Too many access options are better than not enough
  - Bridges and culverts – strong enough to handle the loads
  - Turns (truck trailers)
- Warehouse and Staging Areas
  - A developed warehouse site is best.
  - Utilities (electricity, water, communications)

- Temporary Work Space
  - **Road crossings**
  - **Directional drills**
  - **Water body crossings**
  - **Truck Turn Around**
  - **Staging areas at wetlands**
  - **Steep hills / Slideslopes**
  - **Blasting areas**
  - **Parking areas**

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R/W Width / INGAA Study

- Interstate Natural Gas Pipeline Companies (INGAA) commissioned a study on recommended widths for pipeline construction

- Recommended construction widths:
  - 8” to 16 “ pipe 80’
  - 18” to 24” 95’
  - 30” to 36” 110’
  - 40” to 42” 125’

- These widths do not include temporary work spaces for road crossings or other special areas.

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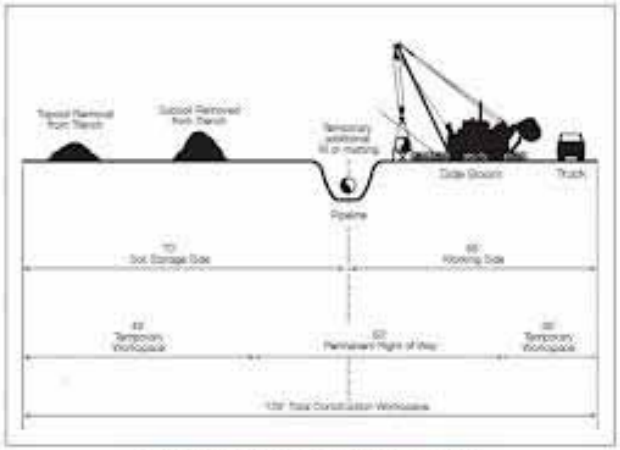
Design / Drawings

Illustration by Chris Gash

- Aerial Photography – Ortho Rectified
- Alignment Sheets – pipeline route details
- Typical R/W Details
- Wetland Maps / Topographic / Environmental Permits
- Site specific
- Mechanical



Example of soil segregation into separate stockpiles

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Contracting

- Aerial Photography
- Land Services / Right of Way
- Survey/Archeological/Biological/Permitting
- Engineering/Drafting Services
- Construction Management
- Construction
  - Union/Non-Union

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Things to Consider

- Don’t let landowners or public officials find out from newspaper
- Communicate early and often with public officials and landowners
- Don’t skimp on up front planning
- Pre-filing meeting with Regulatory Agencies
- Figure out all the details and include in regulatory filings
  - Make sure all information/drawings/tables match
- Justify construction width needed
- Plan for environmental compliance

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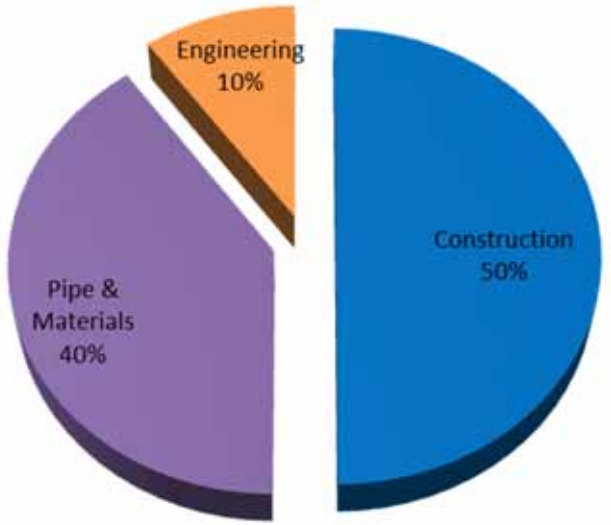
Things to Consider (cont.)

- Credibility and accuracy of information with regulators and landowners is key
- Plan and schedule activities, materials, and construction

Cost Drivers

- Pipe Materials (40%)
  - Length / Size
  - Purchased by weight (e.g. $1200/ton)
- Construction / Installation (50%)
  - Length / terrain / obstacles (e.g. rivers, roads, rock)
  - Wetlands
- Engineering (10%)
  - Design /construction management
  - Land Rights (2-3%)
    - Time
    - Cost
  - Regulatory (2-3 %)
    - Time
    - Mitigation



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Keys to Success

- Proper Planning
  - Investigate options, gather information, figure out details
- Don’t underestimate the power of communication with the public
- Engage with Regulatory Agencies early
- Invest in experienced qualified resources during planning phase of project
  - Right of way
  - Environmental Permitting
  - Engineering / Design
  - Construction Management

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Questions?

Thank You

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October 23, 2012