

Using a GIS for gathering lines in Centurion Pipeline

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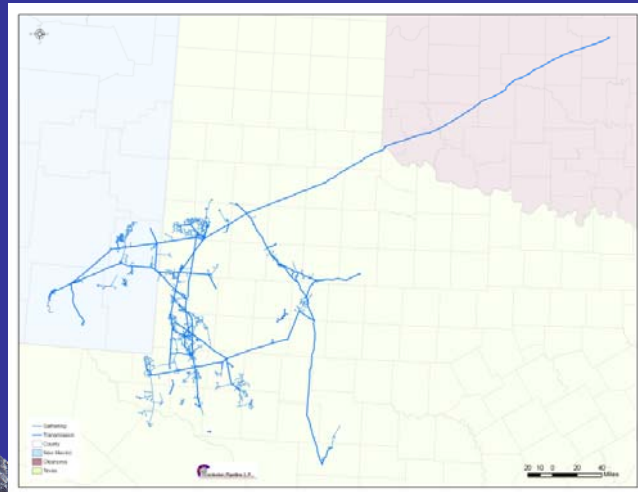
Centurion Pipeline

- Centurion Pipeline has more than 3700 miles of gathering and 2500 miles of transmission pipelines.
- Operations in Texas, New Mexico and Oklahoma.
- Crude is the only commodity that Centurion transports.

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Centurion pipelines



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Centurion GIS status and current goals

- Transmission lines are already in GIS-based Pipeline Management System
- Next steps in pipeline database applications:
 - Made available transmission information to field users.
 - Capture and input gathering line data.

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This presentation

- Focus mainly on description and capture of data in the form of hand-made paper maps.
- Briefly describe a workflow proposal of a mobile mapping application setup using the captured data.

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Gathering Lines from diverse heritage

- Heritage 1
 - Gathering :1600 mi
- Heritage 2
 - Gathering :1500 mi
- Heritage 3
 - Gathering :600 mi



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Map data

- Pipeline geometry and attributes
- Background information
- Details and schematic data

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Heritage 1 - 400' Map



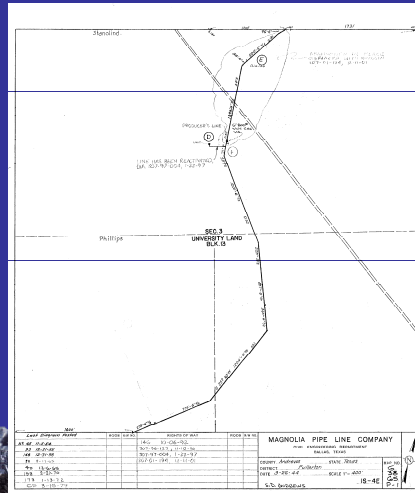
- Jeffersonian PLSS
–based
- 1":400'
- Groups and
nomenclature
origin by gathering
system
- 900 maps

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Heritage 1 - 400' Map

- Map
 - Length and orientation info
 - Jeffersonian PLSS – based
 - Diagrams and updates

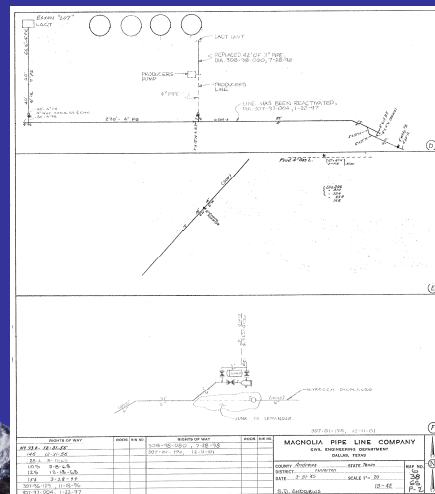


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Heritage 1 - 400' Map

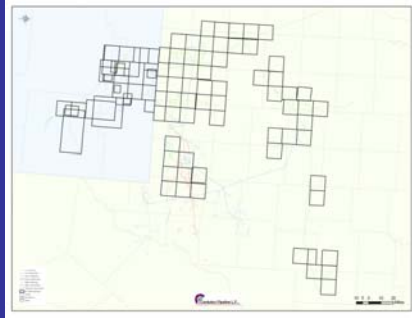
- Detail sheet
 - Separate sheet
 - Multiple scales
 - As many additional pages as necessary



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Heritage 2 - Gathering Map



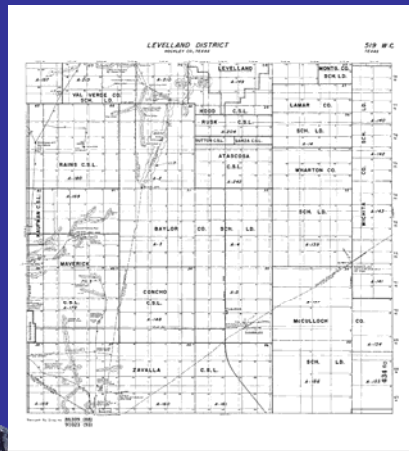
- Regional coverage
- 1":3000'
- 137 maps

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Heritage 2 - Gathering Map

- Map
 - Regional coverage
 - 1":3000'
 - Land sections
 - Jeffersonian PLSS – based grid



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Heritage 2 - Section Plat



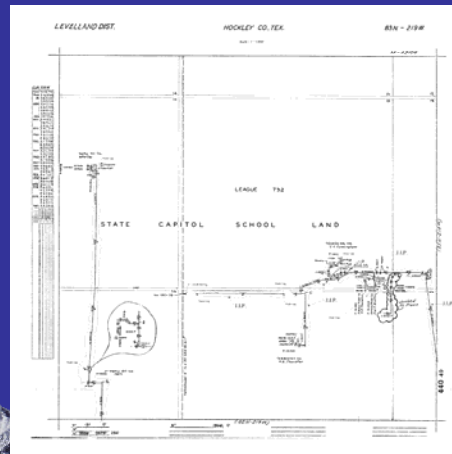
- Jeffersonian PLSS
- based
- 1":300'
- Single origin
- 1420 maps

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Heritage 2 - Section Plat

- Map
 - Jeffersonian PLSS - based
 - 1":300'
 - Single origin

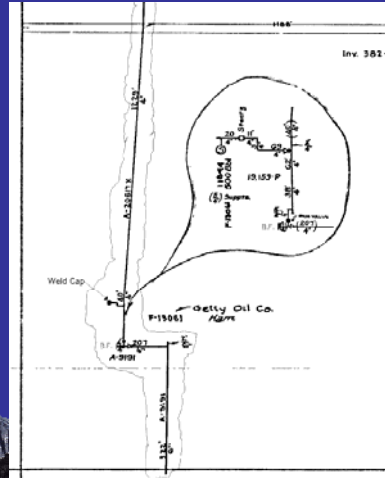


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Heritage 2 - Section Plat

- Details
 - Embedded in map

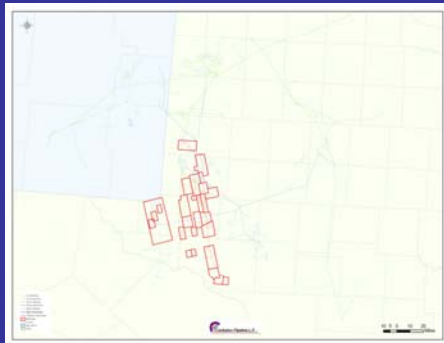


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Heritage 3 - Field Map

- No grid
- 1":1000'
- Whole or half gathering system
- 30 maps

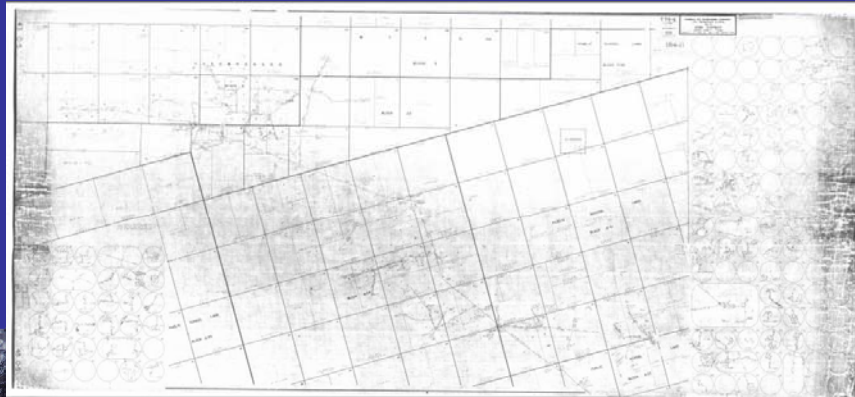


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Heritage 3 - Field Map

- Map

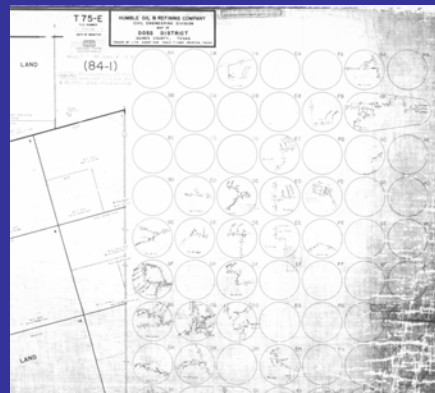


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Heritage 3 - Field Map

- Details
 - Details on the sides
 - Schematics or
 - Various scales



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Lines with diverse heritage

	Heritage 3	Heritage 1	Heritage 2	Heritage 2
Map Type	Field Map	400' Map	Gathering Map	Section Plat
Coverage	Complete or half GS	1 sq mi; approx a land section	Complete GS	1 sq mi; approx a land section
Scale	1":1000'	1":400'	1":3000', usually no scale shown	1":300'
Paper Size	42" x 64"	15" x 18"	Various	21"x 21"
Locator grid	No	N-W nomenclature with various origins	No	N-W nomenclature with a single origin
Pipe Info	Diameter, length, status	Diameter, length, status	Diameter, length, status	Diameter, length, status
Background Info	PLSS	PLSS, ownership	PLSS	PLSS
Coordinates	No	No	No	No
Index Map	No	No	Yes	Yes
Detail Drawing	At upper and lower margins	As separate pages	No	Integrated with map

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Usually unavailable data in gathering cartography

- Coordinate system and datum
- Graphic scale
- Stationing values and equations
- Pipe grade
- Metadata

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Capture: Georectification

- Use of PLSS Grid
 - Individual Maps
 - Map corner match PLSS corners
 - PLSS corners are visible
 - Map Groups
 - Mosaics
 - New grids

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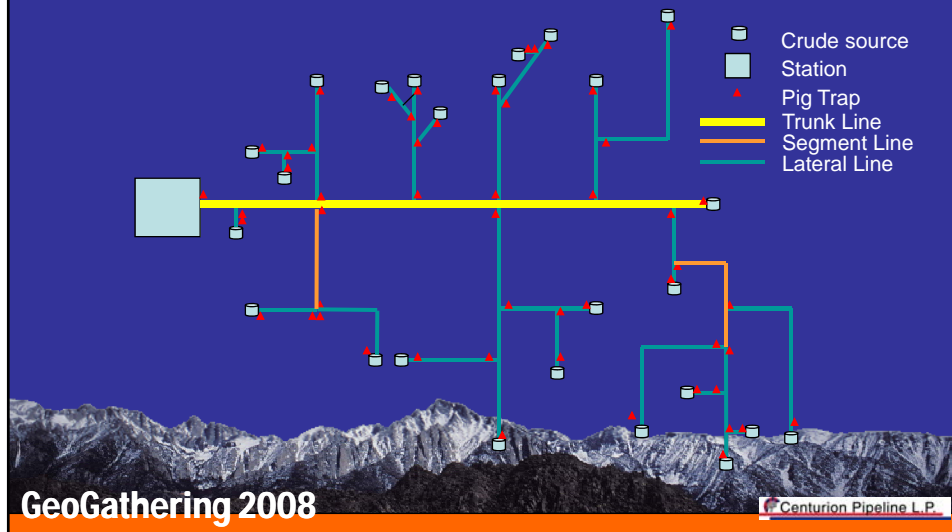
Capture: Centerline Data

- Line definition and classification
 - Piggings operations define individual lines in a network
 - Trunk, segment and lateral lines
- Geometry
 - Edge matching: PI position has precedence over map border measurements.
 - Schematics excluded from centerline capture.

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Gathering lines classification



Capture: Centerline Data

- Attributes
 - Basic: Diameter, material, status.
 - Not mandatory attribute collection.
- Details
 - Existing details
 - Crude Sources
 - Connections
 - Equipment



Details are to be maintained as a separate collection



- Existing details
- Crude sources



- Connections
- Equipment

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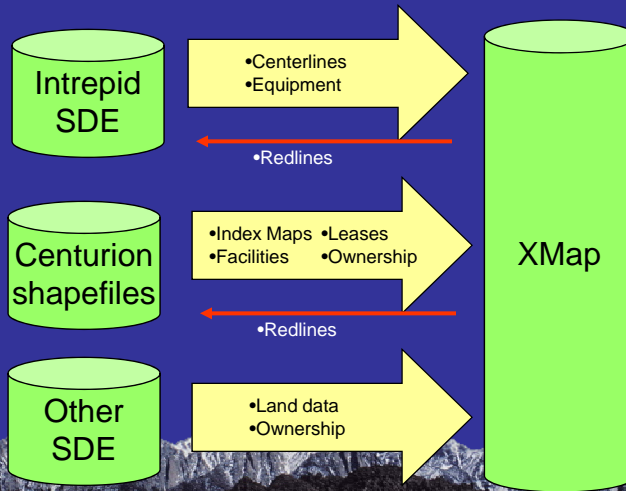
Use of gathering line information

- Standardized generation of updated cartographic products
 - Truck Books
 - Flight Maps
- Mobile mapping applications

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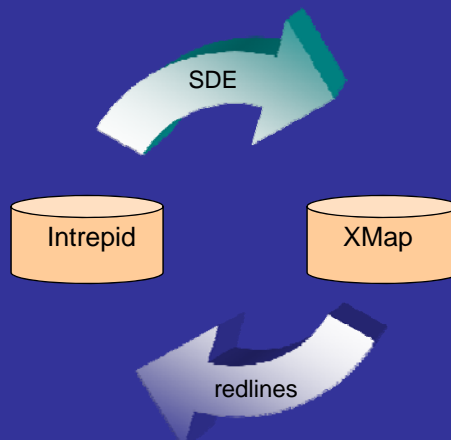
Mobile mapping: short term setup



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Proposed Permanent Setup



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Conclusions

- Analysis of original data helps in higher quality of input data
- A clear definition of the sources of pipeline geometry and attributes, background info and details allowed for a more efficient data structure design and a better capture process.
- An inspection of the overall original map organization improved the georectification method selection
- Wider area maps are less detailed but have better geometric integrity.
- Smaller area maps can be more accurate but were harder to maintain.
- A mobile mapping solution needs to count on users input.

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Thank you

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