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CREATING BALANCE

Federal/World Impacts on Greenfield Landfill Siting

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Background

- **DPC owns three coal fired power plants**
 - Two adjacent plants in Buffalo County (DPC's ash landfill is located 3 miles away)
 - One plant in Vernon County (72 miles south)
- **DPC attempts to maximize recycling of bottom ash and fly ash (to minimize landfill volumes)**
- **As a result of recycling, the Genoa plant in Vernon County only has to haul ~10,000 cy/ year of ash to their landfill, 72 miles away**

Background (cont.)

- **In 2005, CAIR was implemented, which required that utilities located in the 28 most eastern states in the U.S. reduce SO_x and NO_x by 2015.**
- **Primary impact of CAIR was substantial increase in waste ash resulting from lime injection to remove (or scrub out) SO₂.**
- **In early 2007, DPC asked RMT to assess the impacts of CAIR on their solid waste management system.**

Federal Impact

- **DPC's primary concern was the impact of CAIR at their Genoa plant due to haul distance to landfill.**
- **DPC wanted to use a primarily high Btu/high S coal at the Genoa plant.**
- **However, high Btu/high S coal requires more lime to remove the SO₂.**
- **Lime introduction imparts an expansive quality to the ash; thus, it could not be recycled in the cement industry.**

Federal Impact (cont.)

- **Worst case: ash waste disposal volumes could increase from 10,000 to 320,000 cy/yr**
- **Implementation considerations: from Jan. 2010 to Dec. 2014 (deadline to start scrubbing)**
- **Many alternative responses were assessed**

Alternatives Considered

- **Beneficial reuse options: extremely limited due to chemical and physical characteristics of the “dry scrubbed” ash waste, even with on-going research efforts by various industry support groups, e.g., EPRI, etc.**
- **Use of DPC’s landfill 72 miles away was not possible due to many factors (e.g., haul economics, cities on route, road types, seasonal impacts, impacts on DPC’s existing landfill, etc.)**

Alternatives Considered (cont.)

- **Use of third-party landfills was also ruled out (tipping fees, transportation costs, liability concerns, etc.).**
- **Another alternative was to develop a “greenfield” ash waste landfill in proximity to the Genoa plant.**

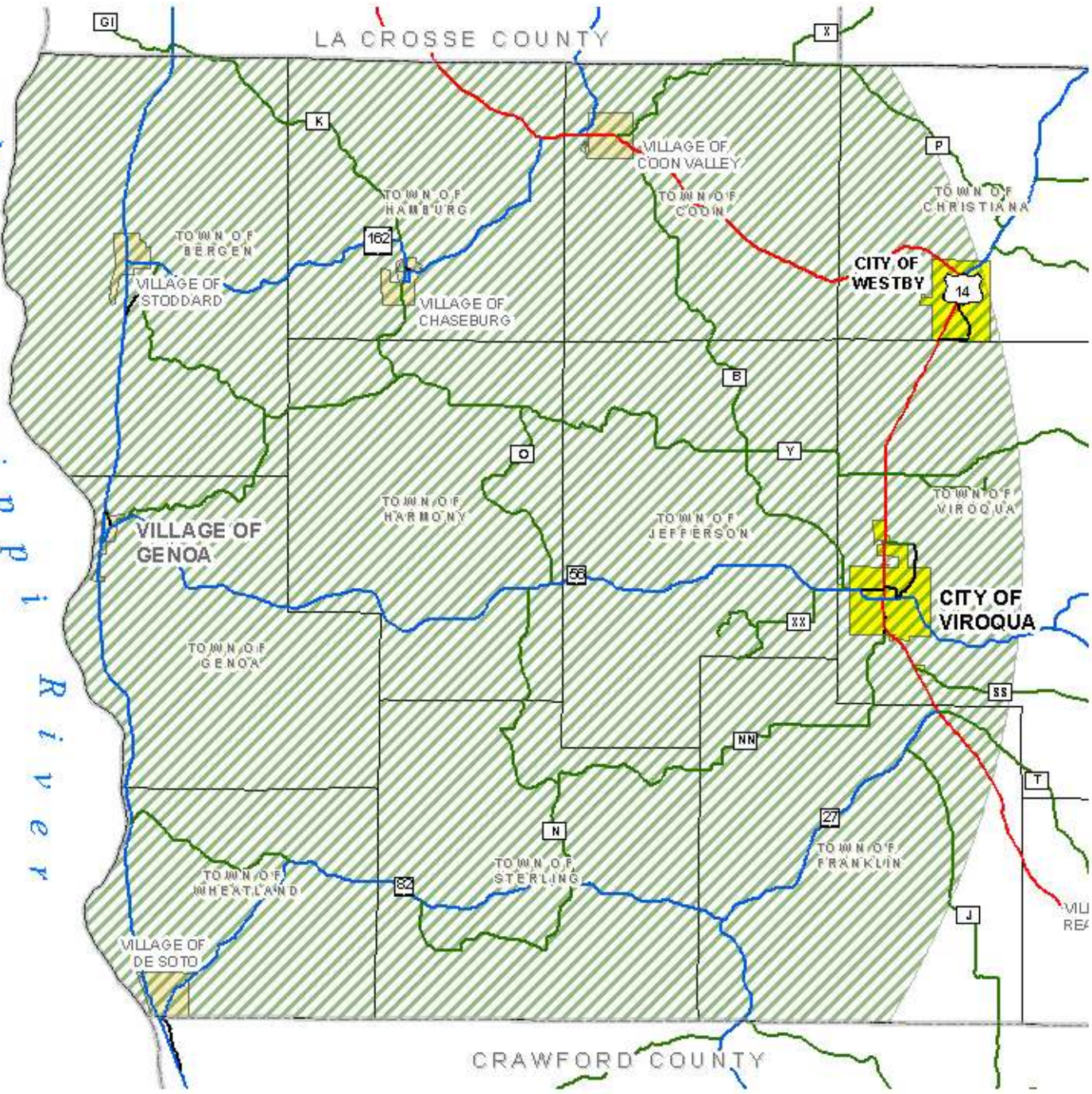
Selected Approach

- **DPC chose to investigate the development of a “Greenfield” landfill within 25 miles of their Genoa plant.**
- **The “greenfield” option was selected based on many site-specific factors, including cost (2 to 6 times more cost-effective)**
- **DPC then asked RMT to identify, rank, and present the top four sites for their review.**
- **This request was made easier (?) by the fact that the Mississippi River essentially cut the search area by half...thus we only had to “screen” about 1,000 square miles of land in Wisconsin.**

Mississippi River

LA CROSSE COUNTY

CRAWFORD COUNTY



G

X

K

P

TOWN OF BERGEN

VILLAGE OF COON VALLEY

TOWN OF CHRISTIANA

TOWN OF HAMBURG

TOWN OF COON

CITY OF WESTBY

14

VILLAGE OF STODDARD

162

VILLAGE OF CHASEBURG

B

VILLAGE OF GENOA

TOWN OF HARMONY

TOWN OF JEFFERSON

TOWN OF VIROQUA

O

Y

33

CITY OF VIROQUA

88

TOWN OF GENOA

88

NN

T

TOWN OF WHEATLAND

TOWN OF STERLING

TOWN OF FRANKLIN

N

27

VILLAGE OF DE SOTO

82

J

VIL REA

CRAWFORD COUNTY

Screening Criteria

- **Absolute criteria considered included:**
 - Landfill capacity dictated by remaining facility life of Genoa Power Plant (~30 years)
 - Site location within 25 miles of the plant
 - Floodplain considerations
 - Setback requirements from highways, parks, public areas, wetlands, and environmentally sensitive areas
 - Site topography

Screening Criteria

- **Subjective criteria considered included:**
 - Soil types
 - Private well setbacks
 - Stream/River setbacks

How To Screen Efficiently?

- **25 years ago, the practice was to “screen” using a series of transparent overlays for each of the criteria typically “marked up” by hand, using available information, such as topographic, road, and wetland maps.**
- **The transparency overlays were hard to read (only 8.5”x11”) and were messy.**
- **A lot of field inspections of prospective sites were required to verify and reconcile information.**
- **What to do???....consider GIS**

Graphical Information Systems (GIS)

- **GIS is a powerful tool that increases productivity and efficiency by providing a visual interface into large datasets, which include:**
 - USGS topographic maps
 - USGS digital elevation maps
 - Aerial photographs (state and federal)
 - Soils data (NCRS)
 - Private well records (WDNR)
 - U.S. Census Bureau (road maps)
 - WDOT (bridge weight limits)
 - Rivers and streams - perennial vs. ephemeral (WDNR)
 - Delineated wetland maps (WDNR)
 - Property ownership (county agencies)

GIS Analysis

- **Analysis capabilities within the software enable the system to identify and screen areas for criteria, such as slopes greater than 33%, which are not conducive to developing landfills.**
- **Software is also capable of screening areas within the typical setback criteria, which includes:**
 - 1,000 feet from a lake
 - 300 feet from a river
 - 1,000 feet from a highway
 - 1,200 feet from a water supply well

Subsequent Analysis

- **Using GIS greatly reduced the subsequent desk-top analysis efforts that were required to identify sites for drive-by surveys.**
- **The GIS approach also helped to reduce the field evaluation effort associated with the identified sites.**
- **Ultimately, 70 sites were screened, of which two (in conjunction with a third site adjacent to the Vernon County Landfill) were identified for follow-on analysis.**

Site Selection Process

- **To maintain their options, DPC chose to perform Initial Site Inspections and prepare Initial Site Reports for the three site locations identified.**
- **It was DPC's goal (following receipt of review comments from the WDNR and the public) to select one site to perform the feasibility study and prepare a plan of operation.**

Tighten Your Seatbelt...

- **In the fall of 2008, the status of the CAIR Act changed:**
 - The CAIR Act had been overturned in July 2008, apparently because the language wasn't strict enough. However, DPC realized that some form of the CAIR legislation would eventually be reinstated, and that some level of scrubbing (SO₂) removal would likely be required.
 - This left DPC, and many other utilities, wondering when they had to start SO₂ removal, i.e., use the \$80 - \$100 million in scrubbers that many of them were in the process of building.

The “World Impact”

- **China had been steadily increasing the amount of high Btu coal that it had been purchasing and sending back home for use in their steel mills and coal power plants.**
- **As a result of these purchases, the price of high Btu coal had increased substantially. High Btu coal price ceilings were projected to eventually be 4-5x greater than recent yearly averages.**

Now What?

- **As a result, DPC made the decision to switch to a low Btu coal, which had only “doubled” in price over the previous year.**
 - The use of a low Btu/low sulfur coal will dramatically reduce the amount of lime needed to remove SO₂.
- **However, it is anticipated that the scrubbed ash from the baghouse can still be beneficially reused by the cement industry.**

DPC's Decision

- **To deal with the economic volatility of the cement industry, several other beneficial use alternatives are being evaluated.**
- **DPC made the decision last December to pursue beneficial reuse options rather than site a new “greenfield” landfill.**

Closing Remarks

Questions?