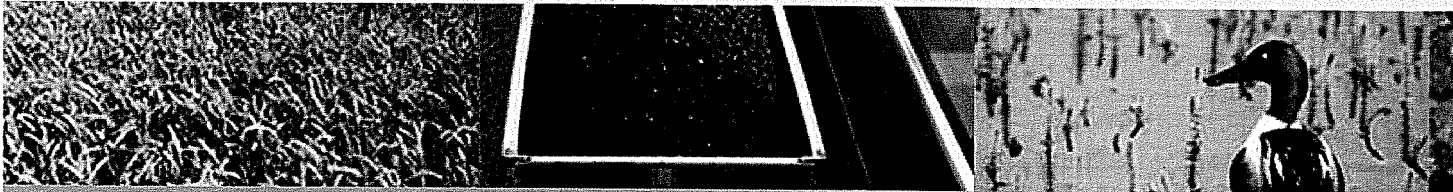
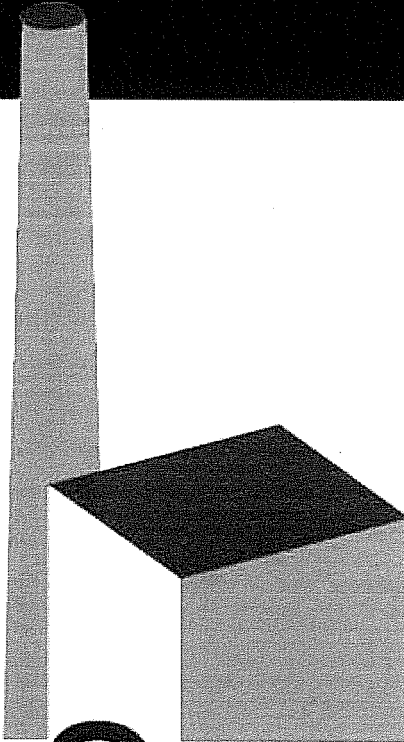


South Dakota Public Utilities Comm

Big Stone II
Energy Conversion Facility
Siting Permit
Public Hearing
September 13, 2005

00 571

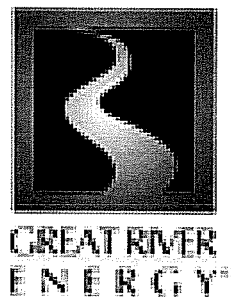




BIG STONE *II*
PARTNERS IN GENERATION

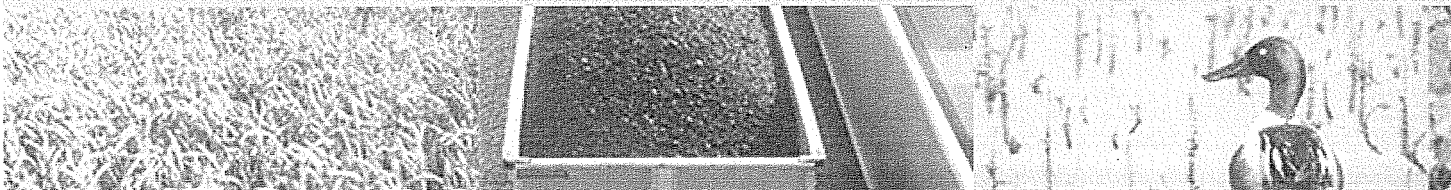
572

Big Stone II Co-owners

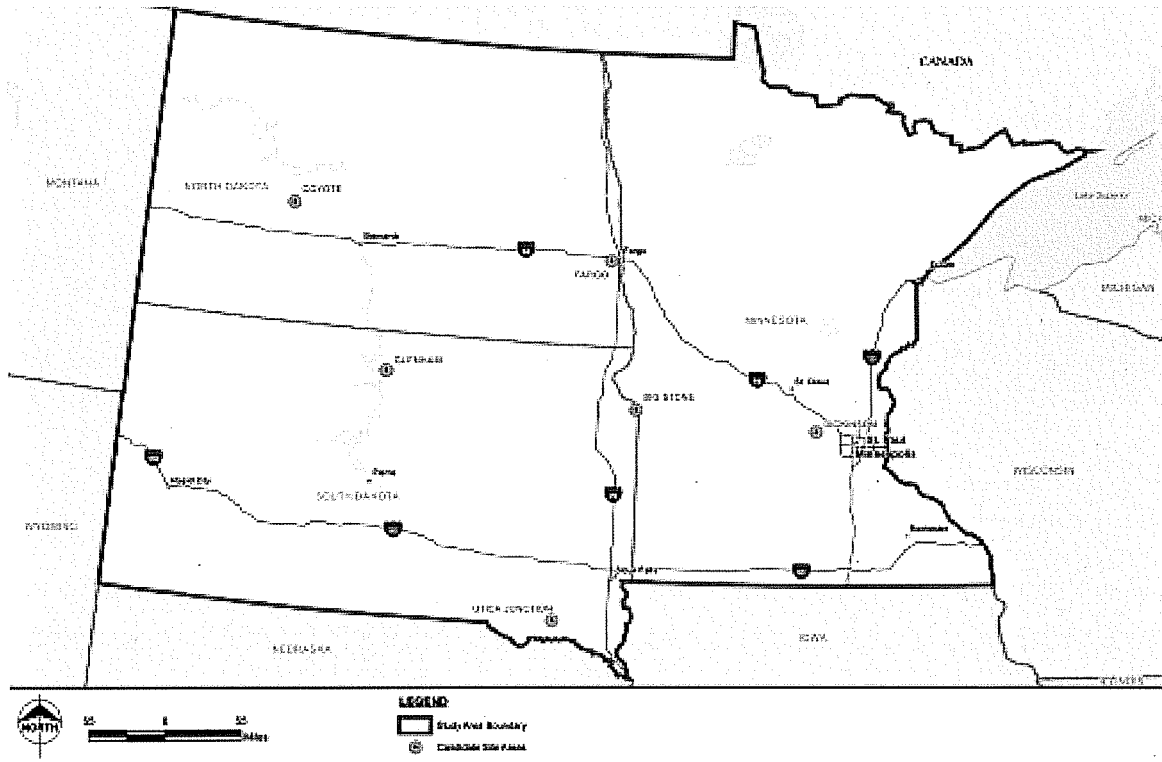


Energy Sources Considered

- Wind
- Super-critical pulverized coal
- Atmospheric circulating fluidized bed
- Integrated gasification combined cycle
- Combined cycle gas turbine (natural gas)



Big Stone II Alternative Site Evaluation Study

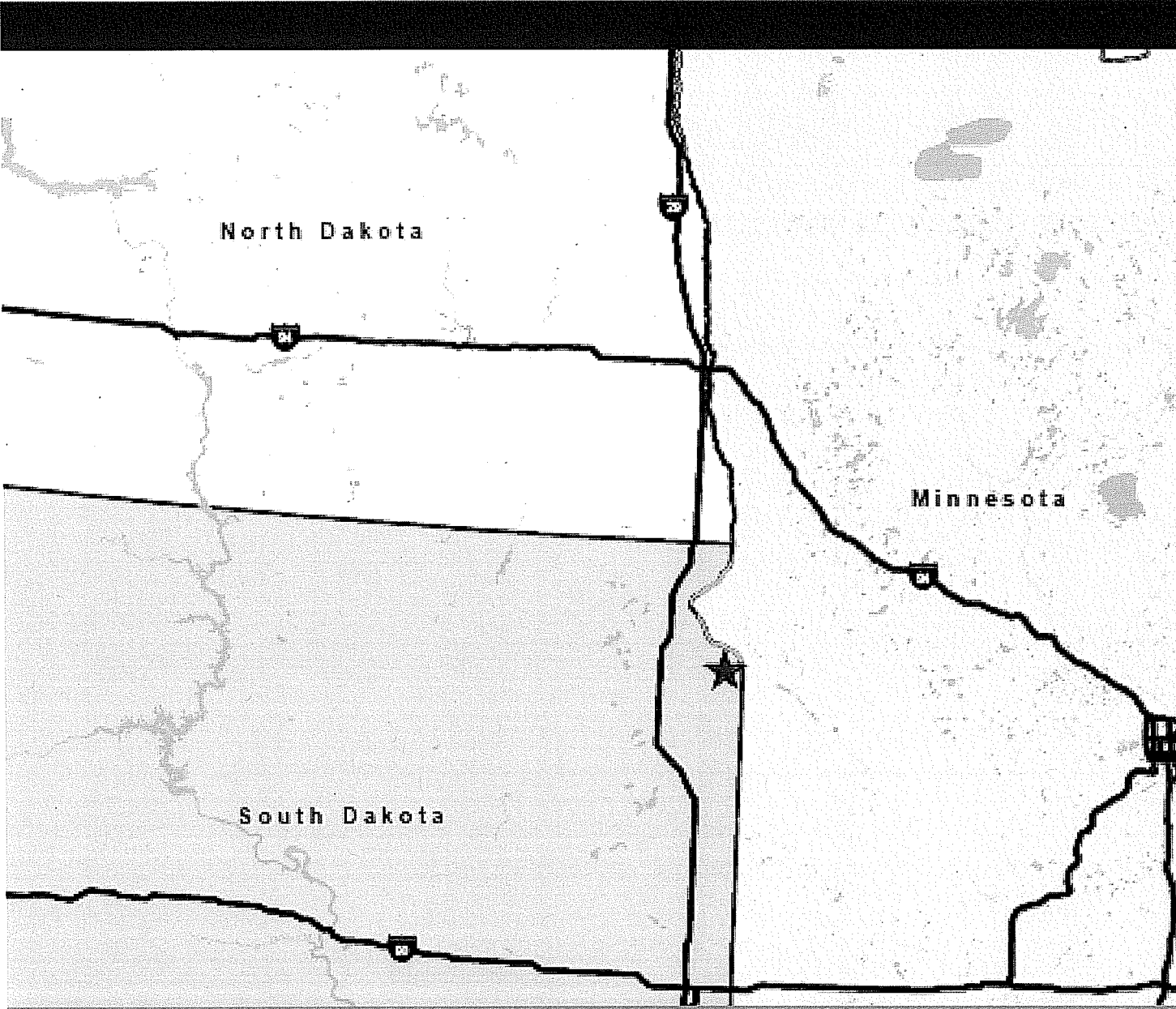


Candidate Sites

- Big Stone – Grant
- Coyote – Mercer
- Dickinson – Wrig
- Fargo – Cass Cou
- Glenham – Walwo
- Utica Junction – Y

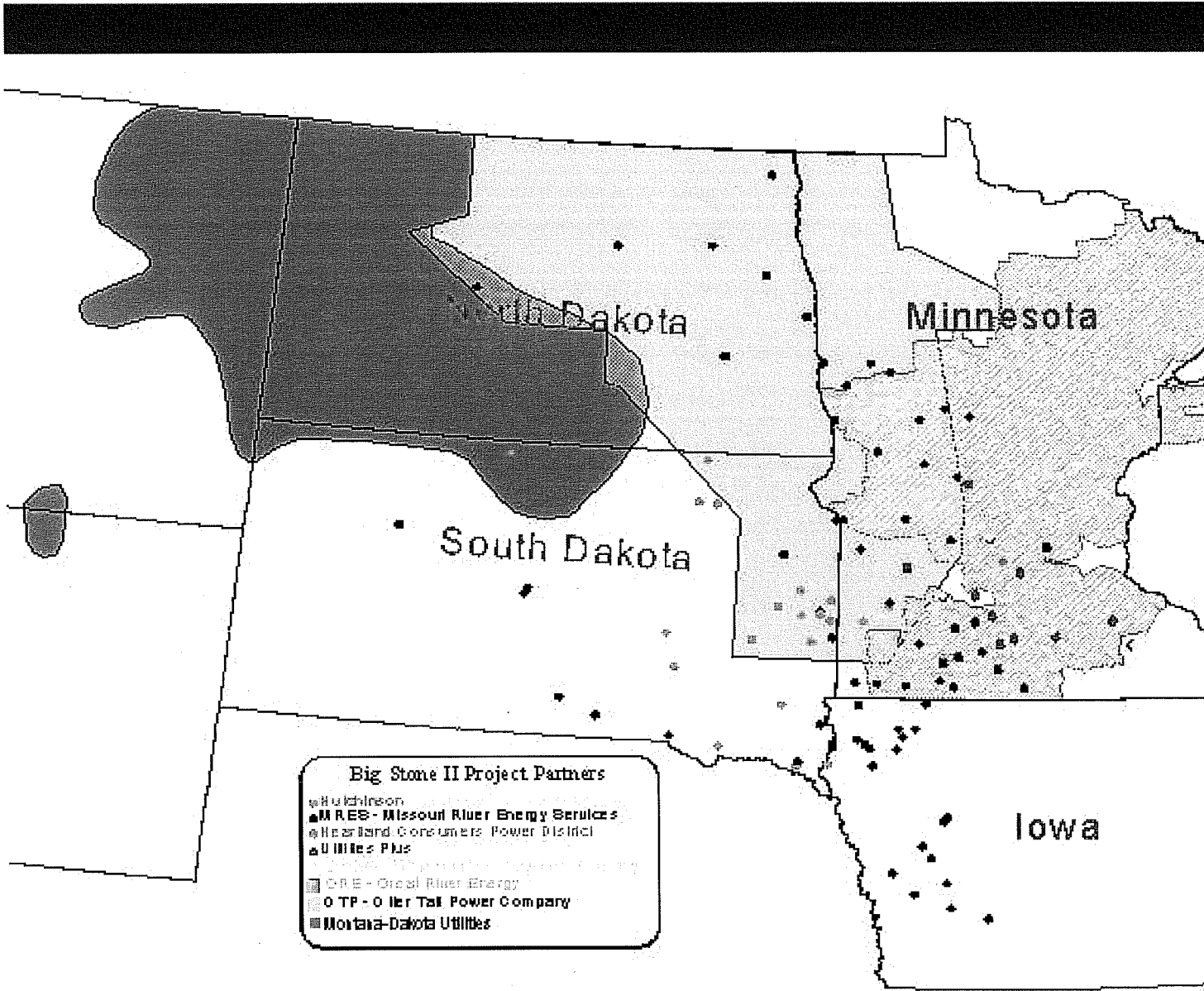
Site evaluation criteria

- Air Impacts: Class
- Restrictions
- Water Supply: SU
- Water Supply Pot
- Environmental: S
- Compatibility, Pro
- Noise Impacts, a
- Fuel Supply: Rail
- Delivery Competi
- Transmission: Pr
- Point and Expect
- Other: Highway A
- Common Facilities



cc 576

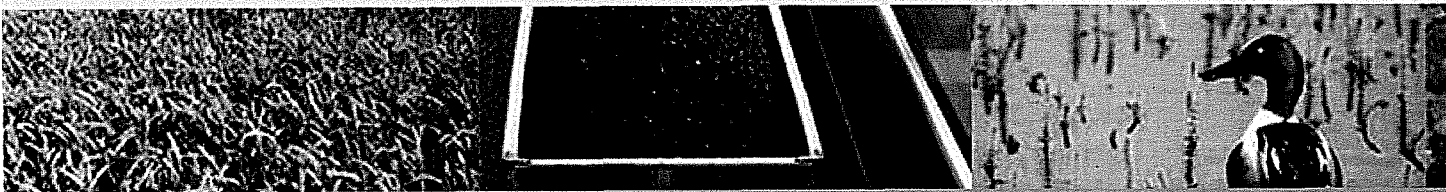
Big Stone II Preferred Site



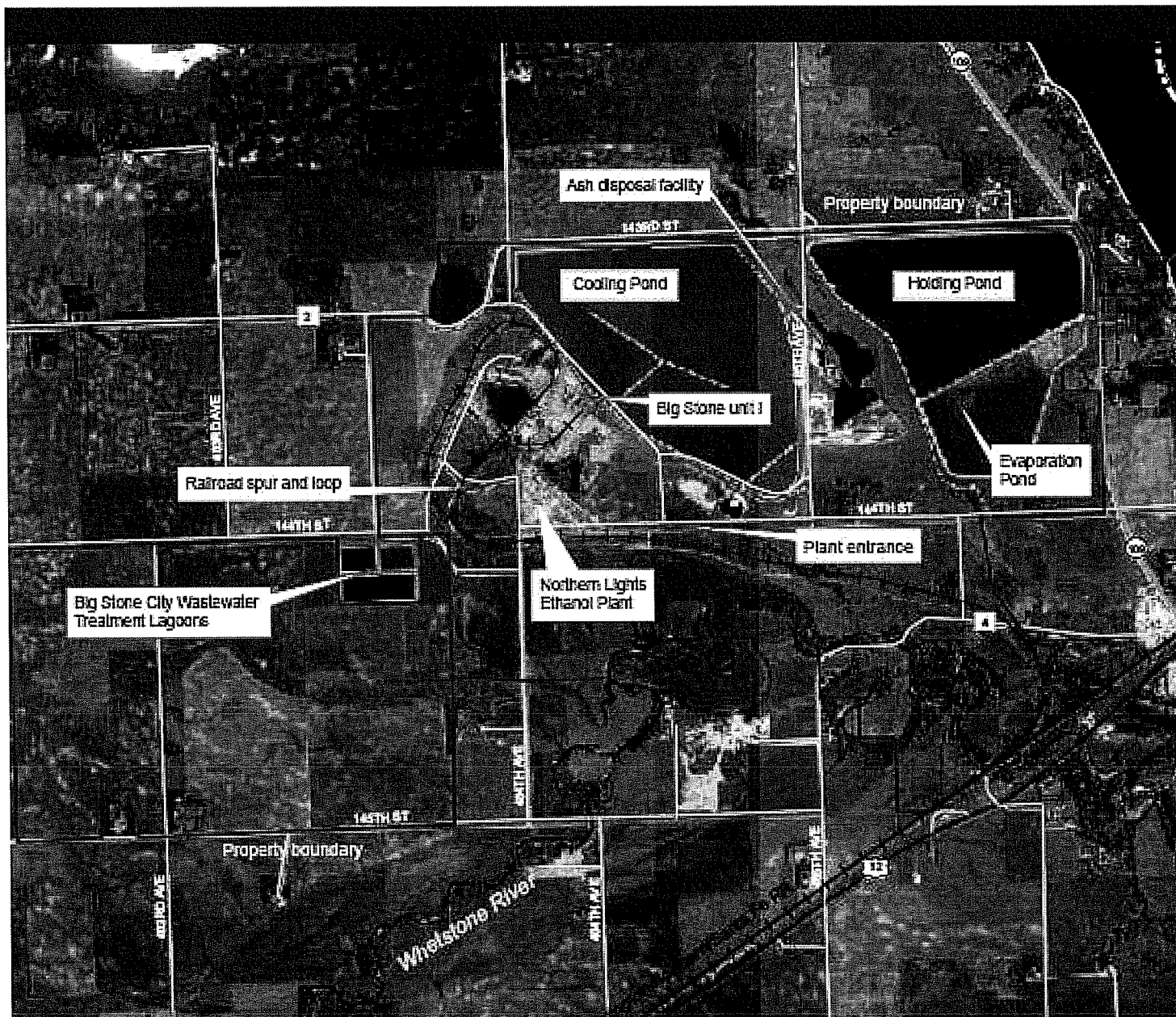
577

Co-owners' Service Territories

Project Description



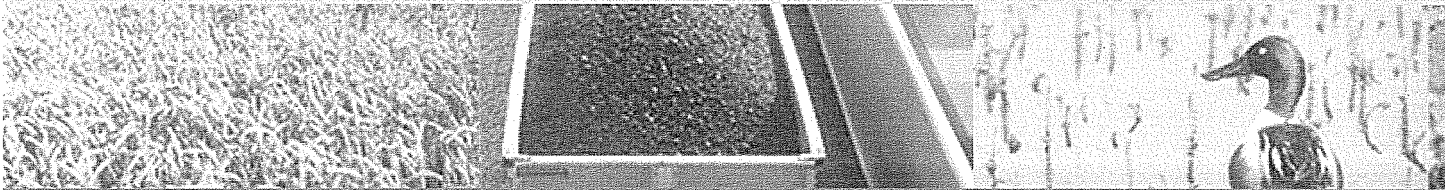
579



Existing Facility

Opportunities to Share Existing Infrastructure

- Cooling water intake structure, pump system and delivery line
- Plant road and rail spur
- Coal unloading facilities
- Solid waste disposal facilities





Big Stone Site

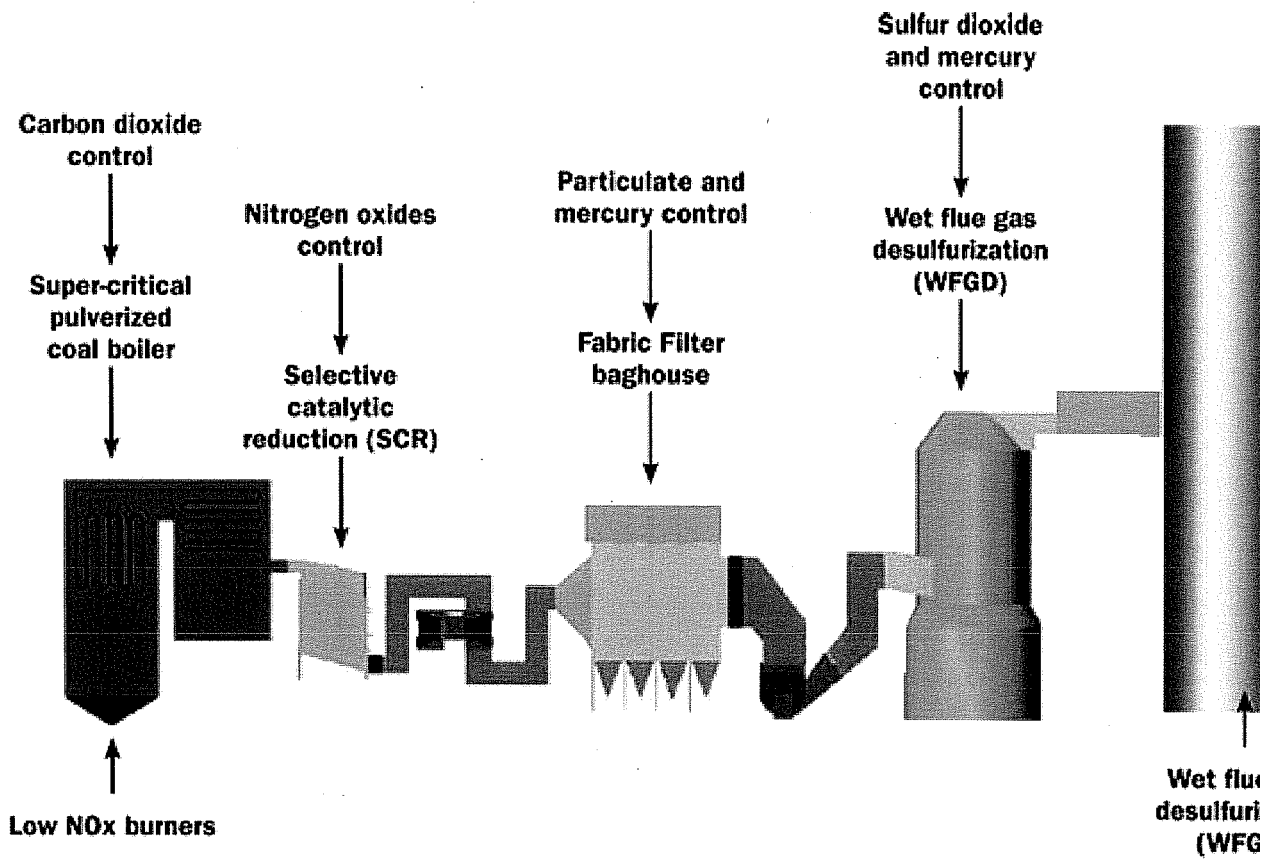


Big Stone Site – Water Appropriations and Storage

10,902 Ac*ft - design annual usage

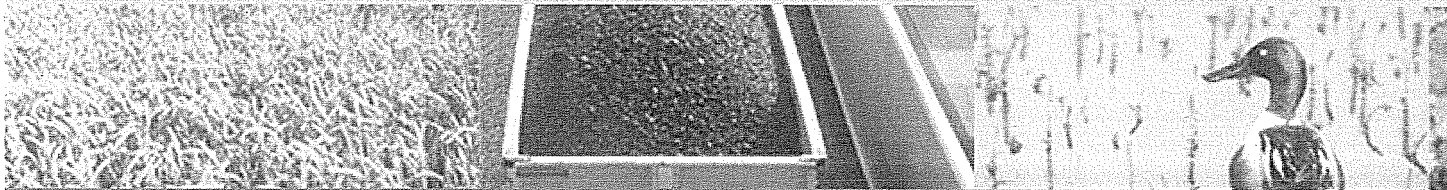
- Holding pond capacity: 965 Ac*ft
- Evaporation Pond Capacity:
- Water storage pond capacity: 9,900 Ac*ft
- Cooling pond useable storage capacity: 3,000 Ac*ft (5440 ac*ft total)
- Total site useable storage capacity current design: 15,300 Ac*ft

Emissions Control Technology



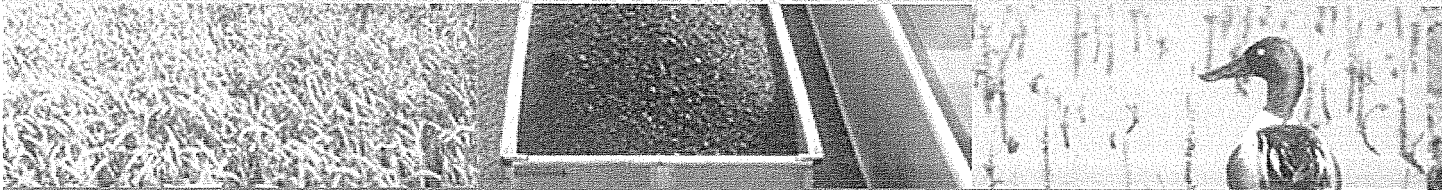
Wet Scrubber

- Historically, dry scrubbers used to remove sulfur dioxide when burning subbituminous coal
- Wet scrubbers are more expensive
- However, wet scrubbers offer
 - More efficient SO₂ removal
 - More efficient mercury control
 - Saleable fly ash



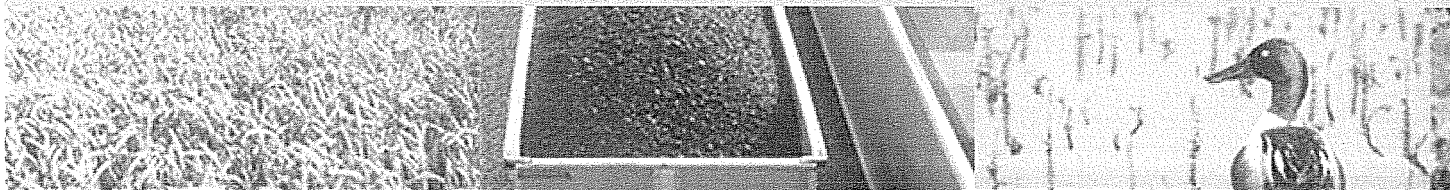
Joint Scrubber Possible Because Wet Scrubber Technology

- Double the size of the scrubber but
60% increase in cost
- Able to share some equipment and
benefits of redundancy of other
components
- Lower per megawatt hour cost for
common scrubber



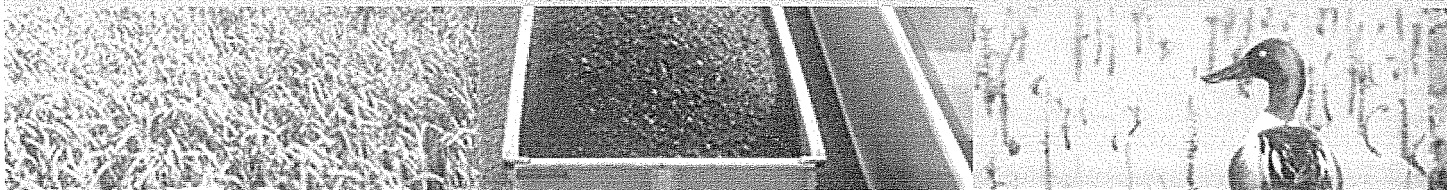
Nitrogen Oxides Control

- Commitment to add Big Stone II and increase nitrogen oxides emissions at the Big Stone Plant site.
- Make Big Stone Plant unit I operational changes to its lower nitrogen oxide emissions
- May also require equipment changes

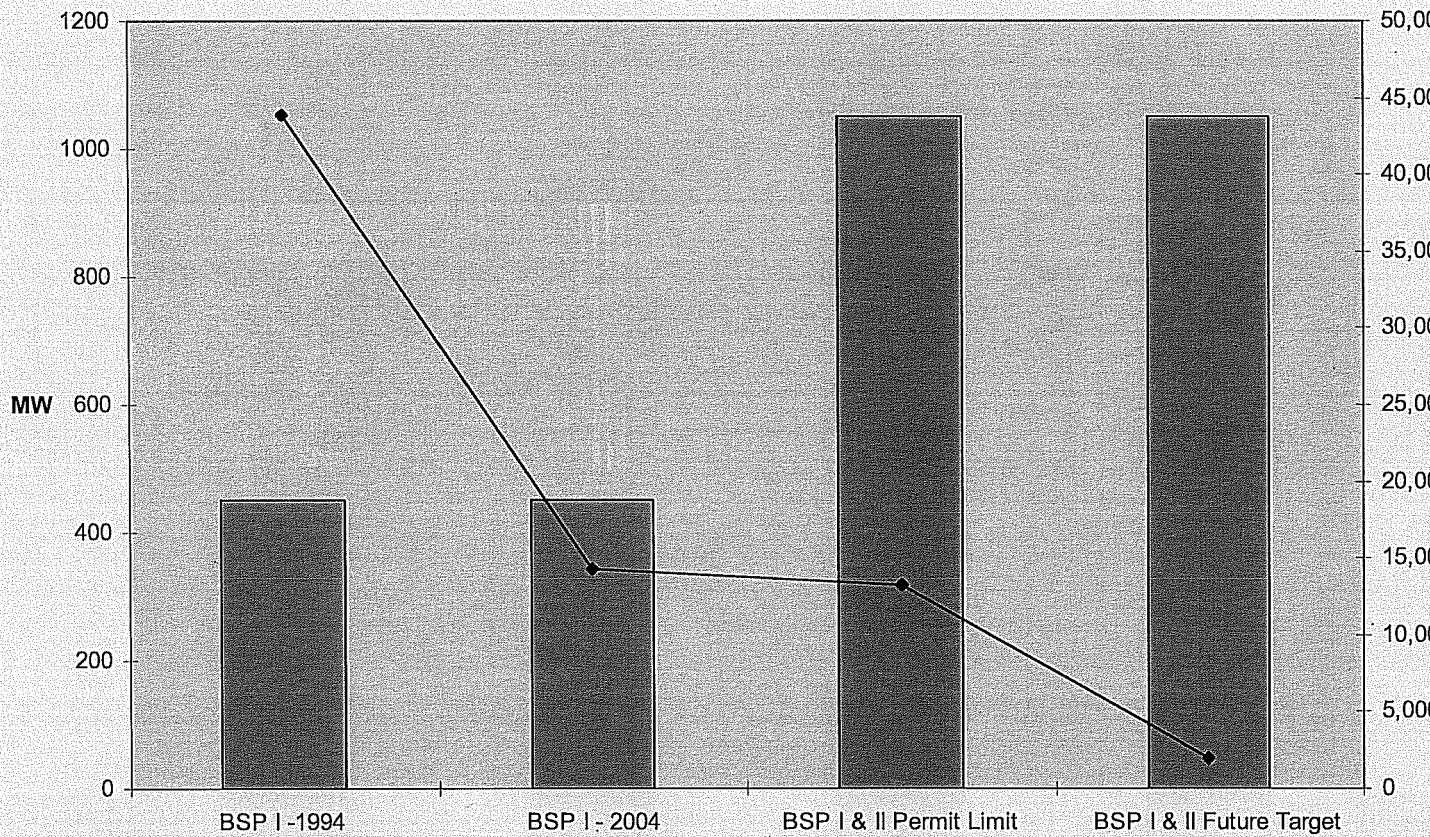


Emissions Control Summary

- Sulfur dioxide, nitrogen oxides, and mercury emissions from both units targeted to be less than or equal to Unit 1's emissions in 2004.

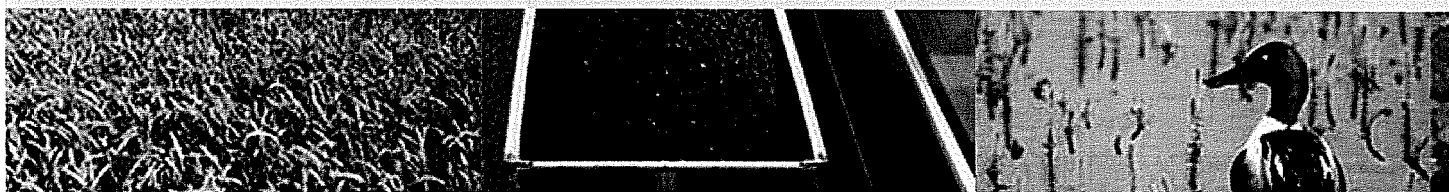


Sulfur Dioxide Emissions



589

Facility Need

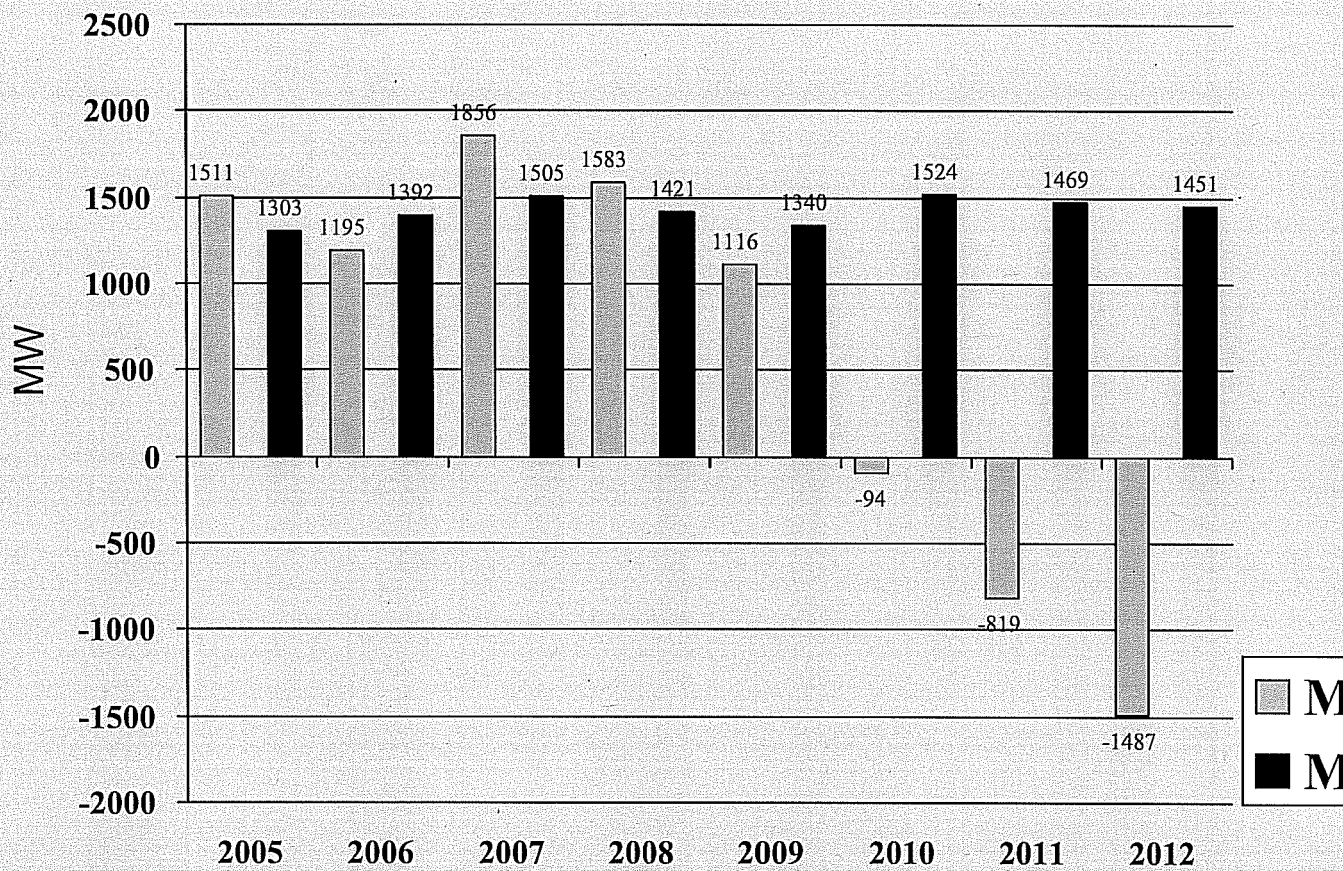


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MAPP Region

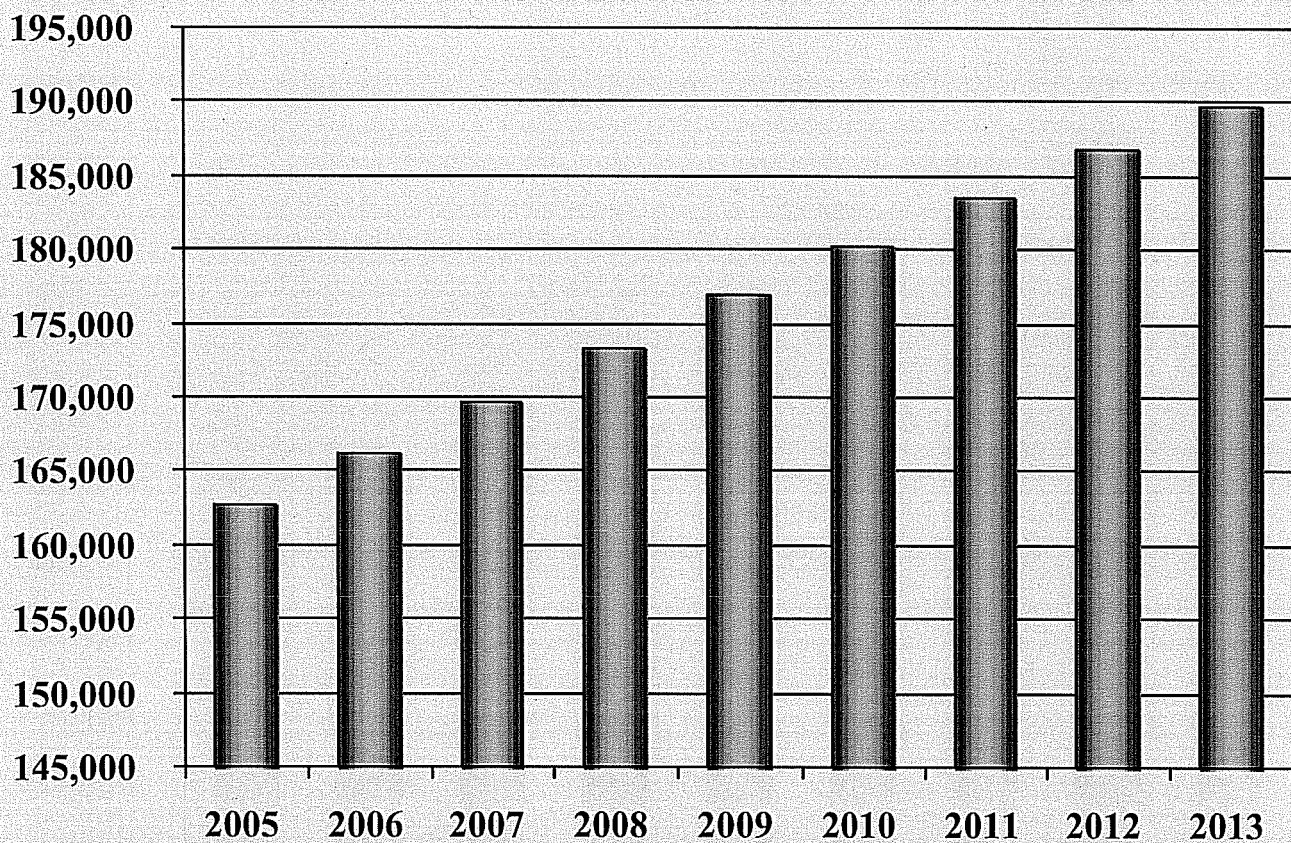


MAPP Surplus/Deficit Forecast



66 591

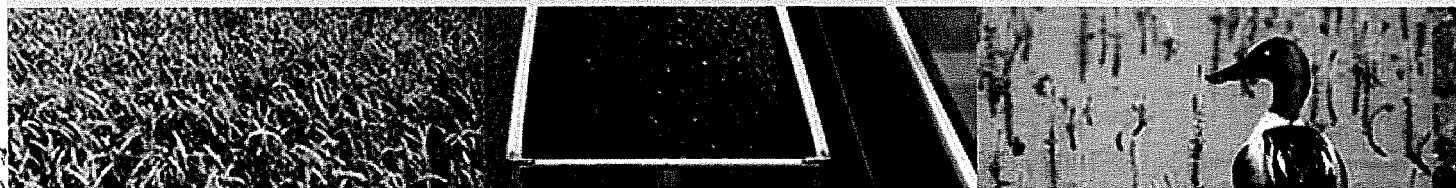
MAPP U.S. Annual Net Energy Fore



Baseload, Intermediate and Peaking Facility Relative Cost

Type of Generation	Capital Cost	Fuel Cost	Typical Production
Peaking	Low	High	Low
Intermediate	Medium	Medium	Medium
Baseload	High	Low	High

Environmental Information



594

595



Self Force Date: 7/2/08 10:12:44 AM File: H:\Projects\2008\03\03\Projects\InP\m\B\img_00206_7601_ArcMap_08ES_4_03_Simg_WMF\em01bct.apr

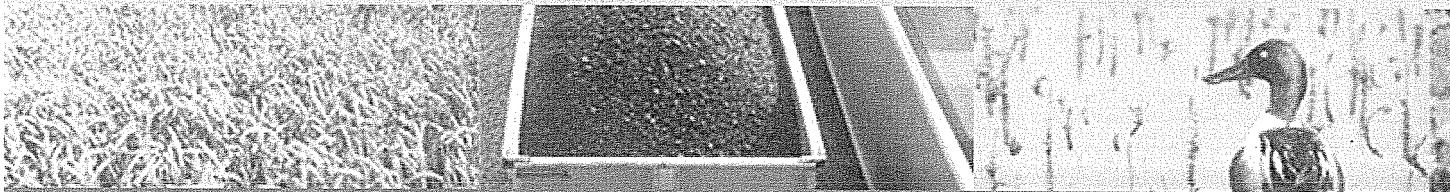
Field of South on Sep Fish ar

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Big Stone II Wildlife

Environmental Impacts

- Physical Environment
- Hydrology
- Terrestrial Ecosystems
- Aquatic Ecosystems
- Land Use
- Water Quality
- Air Quality
- Solid and Radioactive Waste

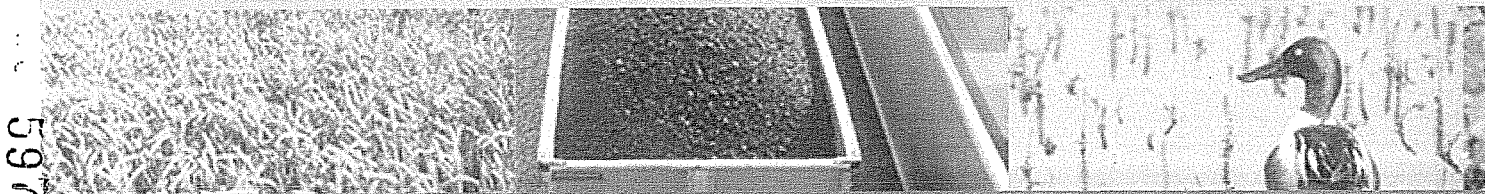


Environmental Impacts

Physical Environment

- Land forms and topography
- Geology
- Soils and Economic Deposits
- Erosion and Sedimentation

Impacts primarily limited to new storage p
area-most other activity within existing
site



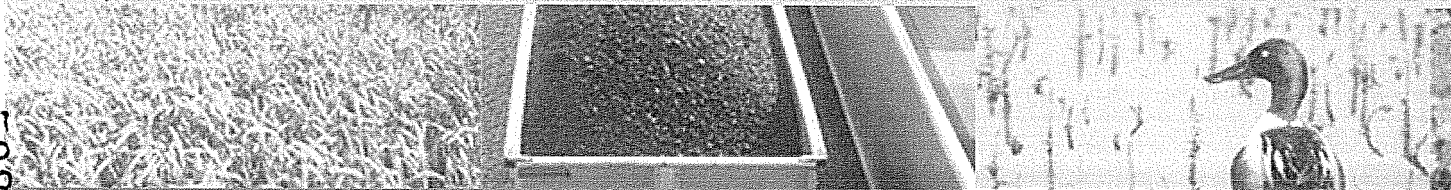
Environmental Impacts

Hydrology

- Surface Water Drainage
- Water Use and Sources

Impacts to drainage primarily limited to
new storage pond area

Increased water needs can be met within
existing operational constraints on
Stone Lake withdrawal

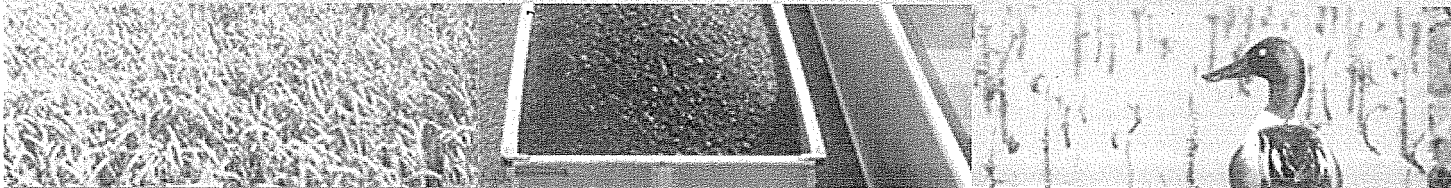


Environmental Impacts

Terrestrial Ecosystems

- Vegetation Communities
- Wildlife
- Threatened and Endangered Species

No adverse impacts are expected

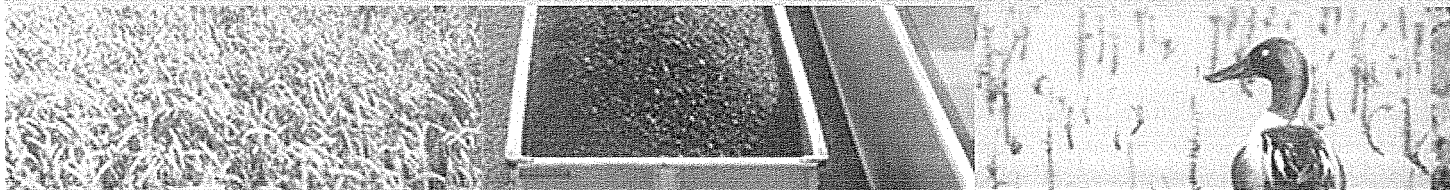


Environmental Impacts Aquatic Ecosystems

- Fisheries
- Wetlands

No adverse impacts to fisheries are expected

Wetland impacts addressed through USACOE permitting process

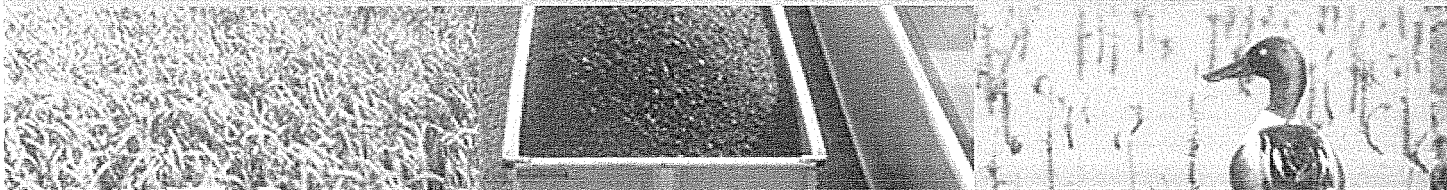


Environmental Impacts Land Use and Land Use Control

- Existing Land Use
- Noise

New unit takes advantage of existing
industrial land use and infrastructure

Incremental noise impact modeled as
insignificant



Environmental Impacts

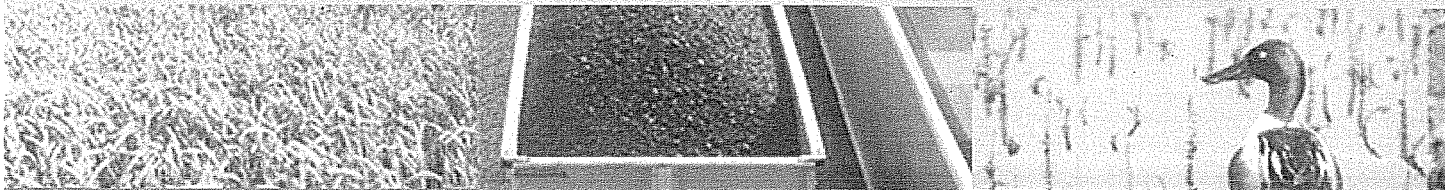
Water Quality

- Whetstone River System
- New Makeup Storage Pond
- Stormwater Management

No impacts expected to Whetstone River

New pond water quality expected to be s
to area shallow lakes

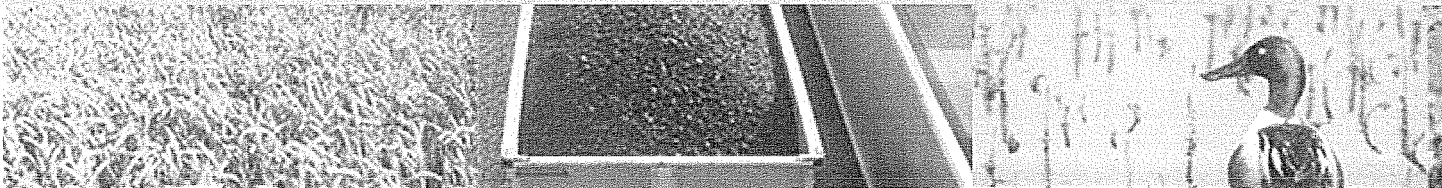
Stormwater will be managed through SW



Environmental Impacts

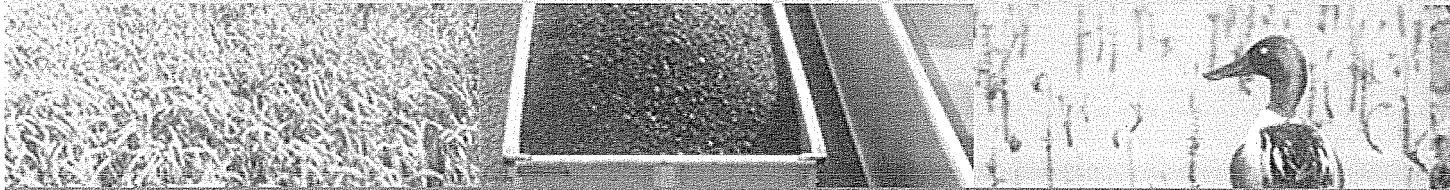
Air Quality

- Common scrubber – no increase in sulfur dioxide emissions
- No increase in nitrogen oxide emissions
- Best available control technology for particulate matter emissions
- Targeted mercury emissions at 2004 level



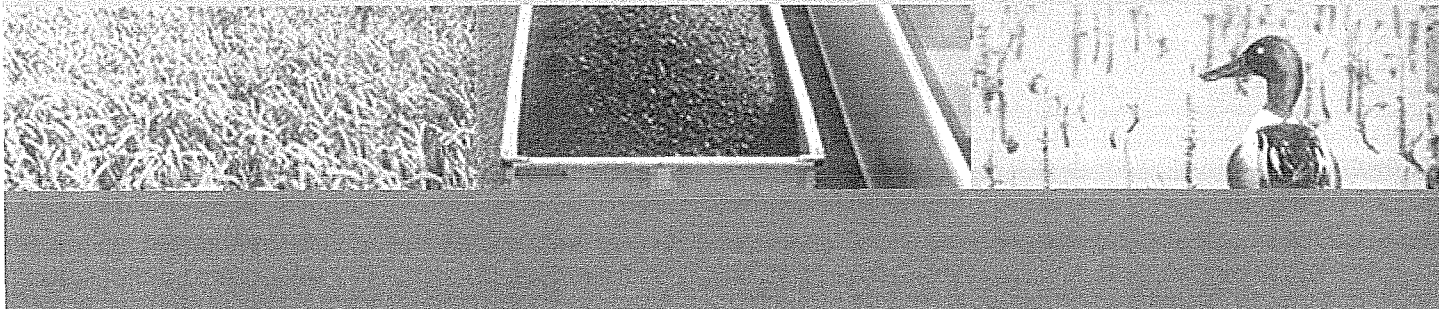
Environmental Impacts Solid Waste

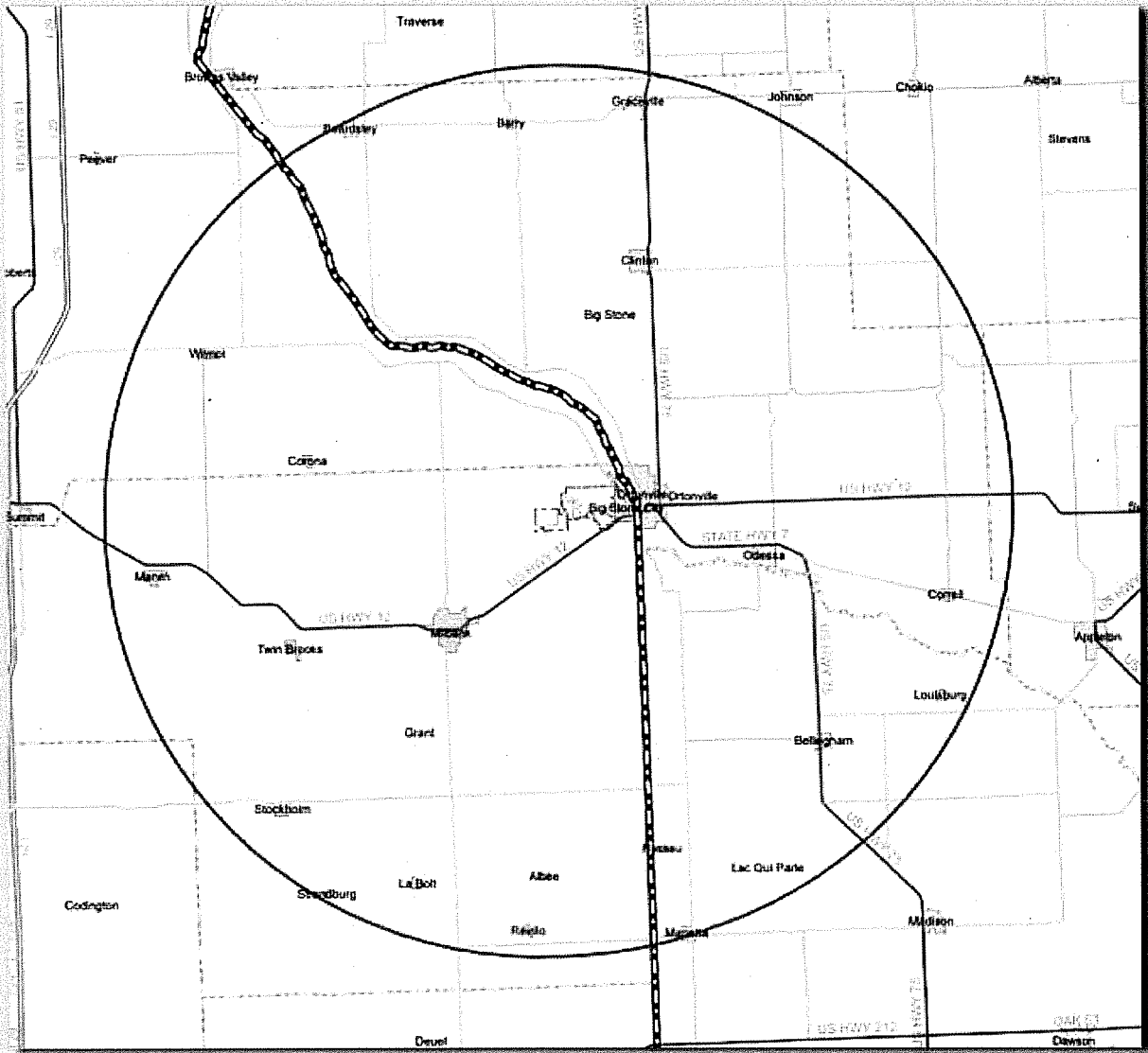
Propose to use existing permitted solid waste disposal facility



Community Impacts

- Economic Impacts
- Infrastructure Impacts
- Community Services
- Population and Demographics
- Cultural Resources





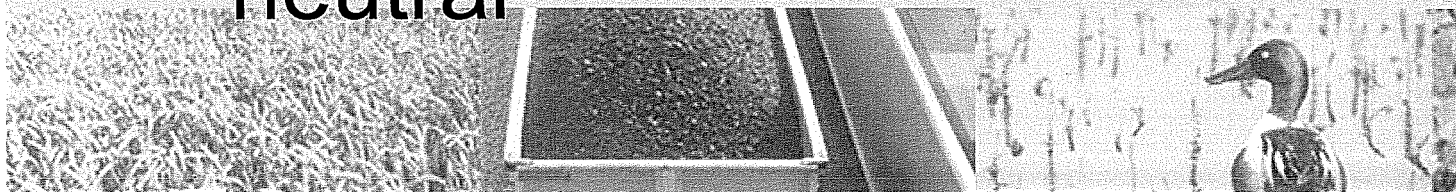
Community Impacts Study Area

Community Impacts

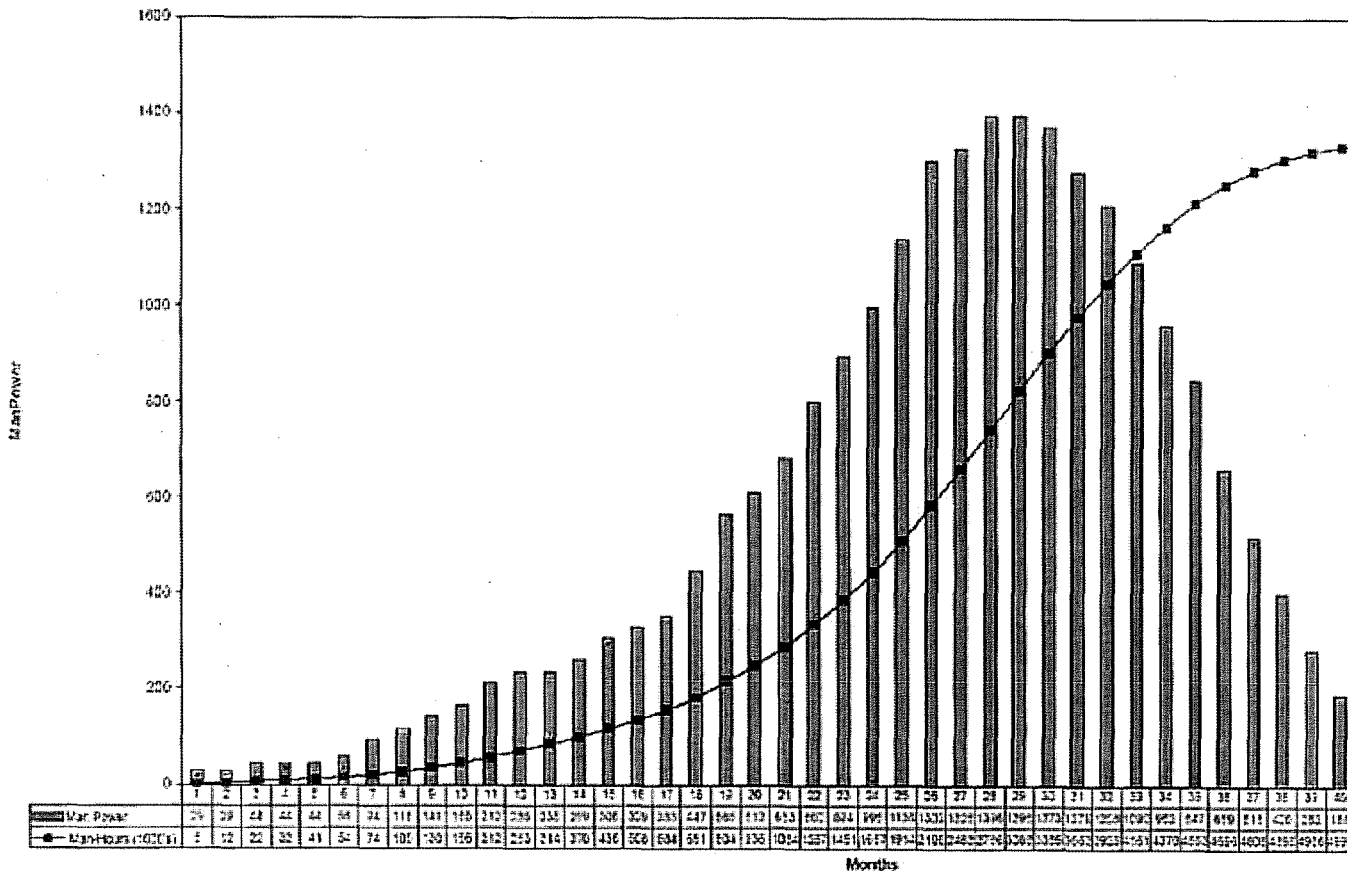
Economic Impacts

- Employment (temporary and permanent)
- Agriculture
- Commercial and Industrial Sectors
- Land Values
- Taxes

Impacts expected to be positive
neutral



Curve Based On 50 Hour Work Week



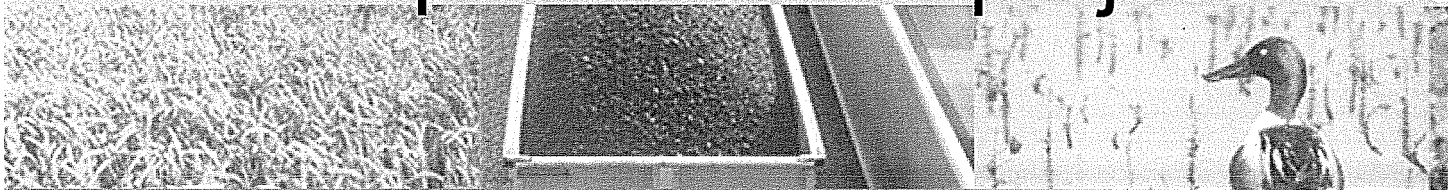
Estimated Construction Labor Require

Community Impacts

Infrastructure Impacts

- Housing
- Energy
- Sewer and Water
- Solid Waste Management
- Transportation

Existing infrastructure generally
adequate to meet project needs



Community Impacts Community Services

- Health Services and Facilities
- Schools
- Recreation
- Public Safety

Existing services not expected to be
overtaxed by project

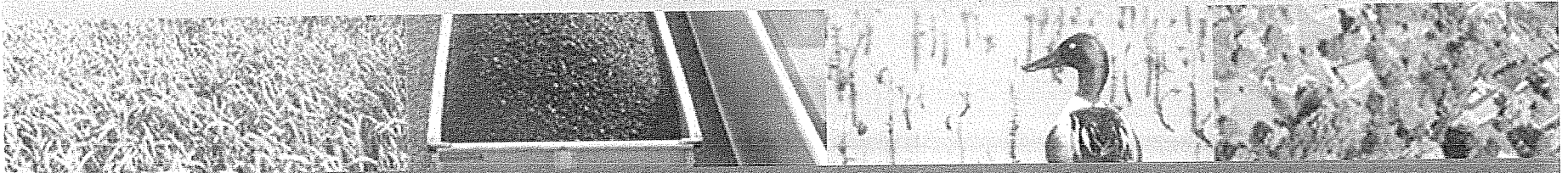


Community Impacts

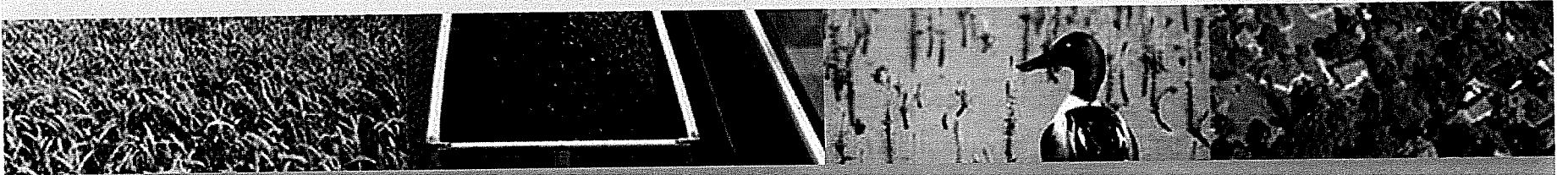
Other Impacts

- Population and Demographics
- Cultural Resources

No adverse impacts expected



Project Schedule



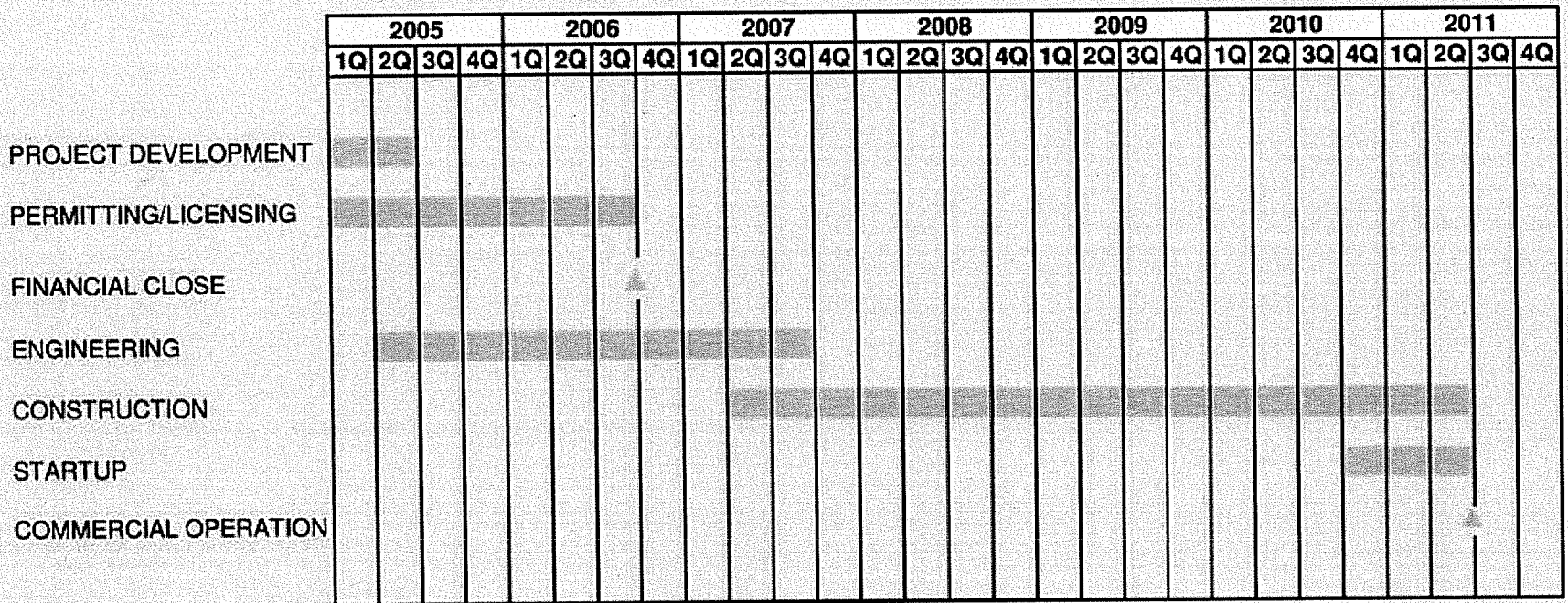


Exhibit 1-4

Big Stone II Project Schedule

BIG STONE *II*

