"PROTECTION OF GROUNDWATER THROUGH URBAN, AGRICULTURAL AND ENVIRONMENTAL PLANNING"

Introduction

The task of your team is to use the following scenario, references and other means to develop a plan to protect natural resources, existing communities, businesses, and neighbors. The proposed nanotechnology manufacturing facility will cause significant land use change and has wide spread support.

Access to clean and safe drinking water is essential to a healthy and thriving community. If a safe drinking water source is compromised or lost, there would be harmful consequences to human health, the environment, and the economy. These losses can be prevented or mitigated to protect current and future sources. Once groundwater is polluted, it will remain that way for decades. The potential for contamination and the high cost of treatment and expense of locating or developing alternate sources make it imperative for government entities to adopt and implement effective strategies for long-term protection. This is especially true for any area dependent on groundwater as its sole source for drinking water.

Many factors, including increasing populations and extensive development, put stresses on groundwater supplies. These include the use of pesticides, fertilizers, animal manure, and storm water runoff which contains metals, nutrients, salts and other chemicals that can leach into groundwater basins. Local governmental planning agencies generally focus on priorities such as land use development, infrastructure needs, the local economy, and a good jobs-per-housing ratio. Planning for groundwater protection often receives insufficient attention for addressing periods of drought, water conservation and efficiency, pollution prevention, recharge zones, surface water management and conjunctive use, storm water management, and future water needs. Due to its nature, most communities have no clear understanding of how much groundwater is available.

Policy makers at all levels of government will be faced with the need to make difficult decisions regarding alternatives and trade-offs to planning future development and managing growth.

While there is obvious support for expected economic benefits and job creation from such a project, several different concerns have been raised by groups, individuals and municipalities. Of particular emphasis is the groundwater aquifer which is important to many existing uses – agricultural, residential, urban and natural ecosystems. While protecting the groundwater aquifer there is the need to address the concerns of the existing users and the proposed nanotechnology manufacturing facility.

Scenario

The rapid development and advancement of computers and other electronic and communication devices has created the need for Nanotechnology Manufacturing

Facilities. New York State, Music County and its Economic Development Corporation are working to help the industry to establish such facilities in Music County.

This table identifies some of the resources required by this type of industry.

Table
Typical Resource Requirements for Nanotechnology Manufacturing Facilities

Resources Required/ Utilized	Number of Nanotechnology Manufacturing Facilities			
	1	2	3	4
Years to Completion	3 – 5	6 – 8	9 – 13	12 – 18
Desired Total Acreage (including buffers)	200 – 400	400 – 600	600 – 800	800 – 1,000
Footprint (ft^2) – Manufacturing Facility	300,000 – 350,000	600,000 – 700,000	900,000 – 1,050,000	1,200,000 – 1,400,000
Footprint (ft^2) - Utility Building	40,000 – 50,000	40,000 – 50,000	80,000 – 100,000	80,000 – 100,000
Footprint (ft^2) - Office	80,000 – 100,000	160,000 – 200,000	240,000 – 300,000	320,000 – 400,000
Clean room space (ft^2)	150,000 – 200,000	300,000 – 400,000	450,000 – 600,000	600,000 – 800,000
Personnel	1,800 – 2,500	3,600 – 5,000	5,400 – 7,500	7,200 – 10,000
Raw Water (MGD)	1.5 – 2.0	3.0 – 4.0	4.5 – 6.0	6.5 – 8.0
Wastewater (MGD)	0.8 – 1.2	1.6 – 2.0	2.5 – 3.2	3.4 – 4.0
Hazardous Waste (tpy)	1,500 – 1,800	3,000 – 3,600	4,500 – 5,400	6,000 – 7,200
Solid Waste (tpy)	4,000	8,000	12,000	16,000
Electrical Power, Peak (MW)	40	70	110	140
Natural Gas, Average (cubic ft./hr @ 20-25 psi)	50,000	100,000	150,000	200,000
Natural Gas, Peak (cubic ft./hr @ 20-25 psi)	90,000	180,000	270,000	360,000
No. 2 Fuel Oil (gallons per year)*	200	200	200	200

*Fuel use is based on one hour of backup generator operation per year.

MGD	Million Gallons per Day
TPY	Tons per Year
MW	Megawatts
PSI	Pounds per Square Inch

Expected Employment Growth and Economic Impact

Overall, the proposed action will positively impact the Towns of Abba and Rascal Flats, Music County, and the greater region as a whole. It will assist efforts to strengthen the

local and regional economies in order to maintain the high quality of life historically enjoyed by Music County residents by creating thousands of new high-paying jobs, nurturing the growth of modern industrial development from the 'new economy' to stem the continuing decline of traditional manufacturing jobs across the region, improving the local tax base, reducing local dependence on government jobs, and offering expanded opportunities for attractive employment closer to home.

Direct Impact

Direct economic impacts associated with the proposed action include most importantly job creation, tax base expansion, increased county sales tax revenue, and increased residential property values.

The previous statements indicate the expectations of community and industry leaders. State government has provided incentives which include $650 million in direct reimbursements and additionally, $700 million in tax breaks.

A site has been approved for this project by the 2 towns and this describes some of its features and some of the areas expected to be impacted by this development. 750 acres lie in the Town of Abba and 250 acres lie in the Town of Rascal Flats. The Abba portion of the site is primarily forested with excessively drained sandy glacial outwash. The Rascal Flats portion is primarily rented cropland used by dairy farms with silty and sand soils.

Water Resources

A primary groundwater aquifer is present at the varying depth of 10' to 30'. It is the primary water supply source for the farms, existing businesses and the residences in proximity to the site. A private water company has wells in this aquifer and provides water to a neighboring subdivision of about 1,000 homes. There are other individual homes with their own private wells around the perimeter of the site.

Surface Waters

A popular trout stream borders the site and has tributaries on the site which feed the stream. At times groundwater feeds the stream and its tributaries and at other times the stream contributes to the groundwater.

A 3,800 acre lake, regionally important for swimming, boating, fishing, and permanent and seasonal homes is within 1 mile of the site and is fed by the trout stream, some smaller tributaries, and drainage ways from the site as well as groundwater inflows. The lake is class A waters and a city and its suburbs, (40,000 population) 5 miles to the north, is exploring using the lake for a water supply.

There are 50 to 100 acres of NYS DEC identified wetlands, mostly forested, on the site and 300 acres off site connected to the onsite wetlands.

The Major river is located 20 miles to the north and also is located 10 miles east of the site. The city to the north uses the river for its water supply. The area of the river to the east has pollution concerns from past industrial uses.

Land Uses

This city is a popular summer tourist destination with the lake, a state park, scenic vistas, horse racing, golfing and a casino as popular activities.

5 miles to the south is a town, population 40,000. This is primarily residential, a bedroom community for an urban area 20 miles to the south.

5 miles to the west is a village, 4,000 population, surrounded by farmland and increasing subdivision development.

40 dairy farms, 50 horse farms, 5 orchards and rented cropland, hay and corn, occupy the land to the west and northeast. The farms bordering the site include two 800 cow dairies, farming 1,000 acres each (including the 500 acres rented land), two 100 cow dairies, farming 200 acres each, a high caliber horse breeding farm (200 acres), 3 horse boarding operations, 30 acres each, and 3 vegetable growers, 10 acres each. The bordering county, 10-15 miles east, is primarily agricultural with small villages.

In addition to the 700 acres of the site, there are significant blocks of woodland, some of which are wetlands, intermingled with the farmland and bordering the subdivision. 20 miles northwest of the site, extensive woodlands dominate the landscape. Various wildlife, typical in forest and farmland areas, populate the area.

Facilities

There is an existing county sewer system with a submain near the site. It is very close to capacity. Some of the residences and smaller subdivisions in the aquifer area utilize septic systems.

Transportation

A north-south interstate highway is located 2 miles west of the site. The remainder of the area has an existing network of state and local roads which are experiencing increasing impacts and delays from commuter and business traffic.

A railroad line is located 5 miles to the west and has freight and passenger service.

An international airport is located 25 miles to the south in a different county.

Concerns

While there is obvious support for expected economic benefits and job creation from such a project, several different concerns have been raised by groups, individuals and municipalities.

Of particular emphasis is the groundwater aquifer which is important to many existing uses – agricultural, residential, urban and natural ecosystems.

While protecting the groundwater aquifer there is the need to address the concerns of the existing users and the proposed Nanotechnology Manufacturing Facility.

Some of the concerns expressed to date include:

CONCERNED ENTITY	REASON FOR CONCERN
Neighboring Towns:	
Agricultural Town	Loss of rural character, need for expanded services and schools. 7,000 – 10,000 more people plus their families.
Mixed Rural Village – Suburban	Loss of small town character, village and rural (7,000 – 10,000 plus their families are projected to be added by this project).
Small Business Owners	Concerned about large corporate competitors. Local businesses anticipate having difficulty expanding due to lack of space in their existing setting, restrictive zoning, increasing land prices and lack of capital (they cannot absorb the capital of expansion in the costs, short term, waiting for the long term increase that larger corporations can).
County and Towns	Infrastructure costs needed for increased roads, waste treatment, water supply, schools, law enforcement.
Trout Unlimited	Concerned about: 1) Water levels – groundwater recharge 2) Spike in temperature – from stormwater discharge 3) Access 4) Water quality of tributaries – stormwater discharge for industry and new home construction.
Lake Association	1) Use of lake water – possible drop in water level 2) Effect on groundwater – drop in water table and recharge, possible effect on lake's quality and quantity.

Farm Bureau – Farmers	1) Loss of farmland for production, manure spreading and loss of rural character – to industry and new homes.

	2) Effect of land value – greater competition 3) Increased taxes 4) Effect of groundwater – drop in water table, risk of pollution 5) Increased traffic and complaints from non farm population
Nature Conservancy	Loss of wildlife habitat, diversity – projected loss of 800 – 1,000 acres and loss of land for new homes
Hunters	Loss of wildlife and wildlife habitat – projected loss of 800 – 1,000 acres

If you think there are other entities that would have concerns, take their positions into account.

Again, the task of your team is to use the following scenario, references and other means to develop a plan to protect natural resources, existing communities, businesses, and neighbors. The proposed Nanotechnology Manufacturing Facility will cause significant land use change and has wide spread support.

Refer to the 2010 oral presentation judges' sheet for guidance on how the judges will award points.