NAME:

FOR NUMERICAL PROBLEMS, MAKE (AND STATE) ANY REASONABLE ASSUMPTIONS NECESSARY FOR GETTING A SOLUTION, IN ADDITION TO THOSE GIVEN. BOX YOUR FINAL ANSWERS.

PROBLEM 1 (40 pts):

The questions below refer to the newspaper article given on pages 5-6. This article was published a few weeks ago in the Wall Street Journal.

a) At what stage in the EQR process is the project described? How can you tell from the article?
The article says that a draft EIS was released and public comments are being accepted (Stage 9 in the chart on p. 4).

b) What stages will happen next?
As the article mentions and following what we learned about the process, a public hearing will be held before a final EIS is prepared. The Findings from it will factor in whether the state and federal governments approve the project.

c) What stakeholders are identified in the article?
Riverkeeper (environmental nonprofit advocating for mass transit)
Local homeowners (who will be displaced or have their views ruined)

d) List five environmental attributes for which, according to the article, potential negative impacts from the proposed project were studied. Briefly explain what were the concerns for each attribute.
Historic resources -- Two houses in a historic district will be demolished during construction
Traffic -- New bridge, with more capacity, may increase traffic.
Water quality -- Pollution may occur from dredging and demolition in construction, and from stormwater runoff during operation.
Visual resources -- Nyack residents' views will be affected.
Natural resources -- Peregrine falcons that nest on the bridge will lose their habitat.
(others are possible)

PROBLEM 2 (40 pts):
A proposed project would rezone the area west of CCNY from mixed use to institutional, demolish the buildings in the area, and construct of new academic buildings and dorms.
Impacts identified in EIS study:

Attribute	**Measured attribute values before project**	**Estimated attribute values after project**		
		Preferred project	**Alt 1 – No build**	**Alt 2 – Omit dorms**
Air quality (ppb)	75	80	75	70
Energy use (MW)	9,000	10,000	9,000	8,000
Transit congestion (people/d)	20,000	18,000	20,000	22,000

Threshold criteria:

Air quality	100 ppb
Energy use	10,000 MW
Transit congestion	10,000 people/d

Importance: "transit congestion" is twice as important to the community as "energy use" or "air quality".

(a) Show the calculation of I and M values for the impact of the **preferred project** on **energy use**
I: set transit at -1 (more is worse), so energy use and air quality each get -0.5
M: impacted / threshold = (10,000 MW)/(10,000 MW) = 1

(b) Fill out the impact matrix (I at left, M at right; don't need to show calculations)

Attribute	**Preferred project**	**Alt 1 – No build**	**Alt 2 – Omit dorms**
Air quality	*-0.5, 0.8*	*-0.5, 0.75*	*-0.5, 0.7*
Energy use	*-0.5, 1*	*-0.5, 0.9*	*-0.5, 0.8*
Transit	*-1, 1.8*	*-1, 2*	*-1, 2.2*

(c) Show the calculation of the value of the total impact for each of the 3 projects.
Preferred project: (-0.5)(0.8) + (-0.5)(1) + (-1)(1.8) = -2.7
Alt 1: (-0.5)(0.75) + (-0.5)(0.9) + (-1)(2) = -2.825
Alt 2: (-0.5)(0.7) + (-0.5)(0.8) + (-1)(2.2) = -2.95

(d) Which project has the best total impact and why?
*The **preferred project** configuration has the highest impact score, so is best overall for the attributes and weightings considered.*
This makes sense because the impact scores are dominated by the transit attribute, which had the highest importance and for which differences in M between alteratives were were biggest, and the preferred project minimizes transit congestion.

PROBLEM 3 (10 pts):
List the three aspects of professionalism that we studied and give two elements of each.
Ethics -- Acting in the best interests of the public and the environment; practicing engineering only where one is competent
Citing sources -- Giving a notation to the source whenever material is taken from somewhere else; including a detailed reference in a footnote and/or bibiliography.
Teamwork -- Practice active listening to teammates; make agendas in advance of meetings to make sure priority topics are addressed.

PROBLEM 4 (10 pts):
Spell out the following abbreviations and briefly explain how each one is relevant to environmental impact assessment:

(a) LEED
Leadership in Energy and Environmental Design -- Certification system for environmentally friendly construction that can help reduce environmental impacts.

(b) NEPA
National Environmental Policy Act -- 1969 law that is the basis for Federal requirement for environmental assessment.

(c) CEQR
City Environmental Quality Review -- NYC regulation that details the requirements for environmental assessment of projects involving City funding or permitting.

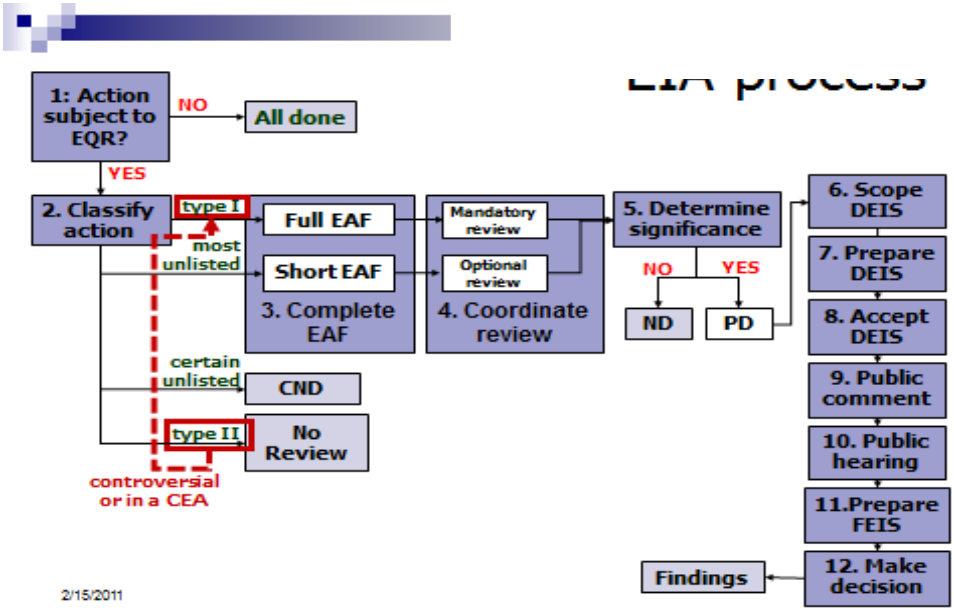
(d) NYCDEP
New York City Department of Environmental Protection -- The City environmental agency, responsible for enforcing environmental regulations and often preparing environmental assessments for projects that need pollution permits.

(e) CEA
Critical environmental area -- A state designation of sensitive regions where proposed projects face greater scrutiny for possible impacts.

(f) EAF
Environmental assessment form -- A checklist-like overview of potential impact areas used to determine whether a proposed project needs a full environmental impact assessment.

GIVEN INFORMATION

1. The SEQR environmental quality review process



2. Equations

$$(E3.1)\quad M=\frac{\text{Existing condition}-\text{Impacted condition}}{\text{Increment criterion}}$$

$$(E3.2)\quad M=\frac{\text{Impacted condition}}{\text{Threshold criterion}}$$

$$(\text{E3.3})\quad \text{Overall rating for each alternative}=\sum_{n=1,N} I_n M_n$$

3. Environmental attributes (those with * are in the CEQR technical manual):

Human

- Public health *
- Socioeconomic conditions *
- Infrastructure *
- Community facilities *
- Historic resources *
- Traffic & parking *
- Transit & pedestrians *
- Waterfront revitalization plan *
- Neighborhood character *
- Urban design *
- Visual resources *
- Shadows *
- Public policy *
- Natural resources *, Energy *, Solid waste & sanitation *

Air

- Air quality *, Atmospheric stability

Land

- Land-use, zoning *, Open space *, soil contamination, soil erosion

Water

- Water quality, water quantity, flow variations, aquifer yield

Sound

- Noise *

State finds no ecology obstacles to new NY bridge

Associated Press

WHITE PLAINS, N.Y. — A new Tappan Zee Bridge would do no lasting harm to the water quality of the Hudson River and might even improve air quality in the area, a state analysis says.

However, nine homeowners in South Nyack, including two in a historic district, would lose their property, the study says. Some residents of Nyack would have their majestic river views obstructed.

New York's draft environmental impact statement was made public Tuesday, part of Gov. Andrew Cuomo's speeded-up effort to get construction started this year on the new span. The governor's office said Tuesday the project is expected to create more than 23,000 jobs.

In October, President Barack Obama declared the bridge eligible for fast-tracked federal approvals. Though the project has been discussed for a decade, this is the first time it has gotten to the environmental impact statement stage.

"Now that we understand the environmental effects of reconstructing the bridge, it is time to start laying out real construction plans," said state Transportation Commissioner Joan McDonald.

The new Tappan Zee would be two spans replacing an aging, overcrowded bridge across the Hudson between Westchester and Rockland counties in New York City's suburbs.

However, there is no plan to include mass transit on the bridge from the start, as had been discussed for years and as many local leaders have suggested. Mass transit could add billions to the projected $5.2 billion cost, but advocates say the bridge quickly will be obsolete without it. Present plans leave room for the possible later addition of mass transit.

Paul Gallay, president of the environmental group Riverkeeper, wondered why there was no study for a mass transit alternative.

"Have they just settled on this two-span bridge with no mass transit as the thing they must do?" he said.

Comments on the draft environmental impact will be accepted until March 15, and public hearings will be held in Westchester and Rockland Counties in late February. A final statement is expected by July and a federal decision finalizing it by August. Construction could then begin, if funding is in place.

The impact statement, assembled by transportation officials, finds that a new bridge would not by itself increase traffic, although it would have eight lanes rather than the current bridge's seven lanes.

Some proponents of immediate mass transit say that if the bridge is an improvement, it will draw more cars.

The draft says that because of plans for stormwater management, there will be no increase in Hudson River pollution from the bridge, once it's completed. During construction, however, dredging, pile-driving and demolition of the existing bridge could affect water quality.

It says air quality could improve because of less traffic congestion.

As for wildlife, the report says the project would have little effect on most creatures in the water, on the land or in the air.

"Any species currently inhabiting the area would continue to occur with the same likelihood," it says. It says oyster beds in the river could be permanently lost during construction but "restoration projects will be explored."

The endangered peregrine falcons now living on the bridge are expected to move to nest boxes on the new bridge, the report said.

Eminent domain would be used to buy the homes that would be in the new right of way in Rockland County, it said.