Environmental Geology, Fall 2015
Review for Exam 3

1. Be able to describe/discuss the hydrologic cycle.
2. Discuss the factors that affect surface runoff.
3. How are sediment yield and the size of a river basin related?
4. What is an aquifer? An aquiclude? What physical conditions are necessary for each?
5. Be able to describe the various types of groundwater aquifer systems.
6. What are some perceptions that people have about groundwater?
7. Review the slide show on Water Use and be prepared to answer questions about it.
8. What is Darcy's Law? You should be able to describe it and the relationship between discharge and head change, length of flow, and hydraulic conductivity.
9. Be able to define the following: permeability, porosity, viscosity, intrinsic permeability, hydraulic conductivity, specific yield, specific retention, field capacity, transmissivity, storativity, specific storage.
10. What is the relationship between particle size and hydraulic conductivity? Particle size and specific yield?
11. What are the forces acting on groundwater?
12. Be able to describe how water infiltrates into the soil over time.
13. What is the Theis Method? What does it tell us about groundwater flow?
14. What is the Jacob's straight line method? What does it tell us about groundwater flow?
15. What is a slug test? What does it tell us about groundwater flow?
16. Be able to list and discuss various types of water pollutants.
17. Define point and non-point sources of water pollution.
18. What are some factors that make groundwater pollution a greater and more persistent threat than surface water pollution?
19. What are LNAPLs? DNAPLs?
20. How do karst aquifer systems affect the spread of pollution?
21. Be able to discuss the issues and types of treatment options for groundwater pollution.
22. What are MCLs? MGCLs? What is the difference between them.
23. Be able to describe and discuss the similarities and differences between the following: 1) Dilute and Disperse, 2) Concentrate and Contain, 3) Reduce, Recycle and Reuse.
24. Be able to describe how a wastewater treatment plant works.
25. Define resource and reserve.
26. Are all resources reserves? Are all identified resources reserves? Explain.
27. Be able to describe/discuss the role of resources in the U.S. economy.
28. Which resources are the most consumed in the U.S.?
29. What is a depletion curve for a resource? How do conservation and recycling affect that curve?
30. What is the concentration factor? How is it calculated?
31. Plate tectonics is a major influence on the location and abundance of resources. Explain.
32. Be able to describe/discuss the various processes that form mineral resources (p.408-417).
33. What are the two types of mining? What are the environmental impacts of each type?
34. What are the environmental impacts of resource processing and use? Explain in detail.
35. How can we minimize the impact of mineral resource development?
36. Be able to describe/discuss the mineral resource cycle.
37. What dubious distinction with respect to energy does the U.S. own?
38. What energy sector does the U.S. get most of its energy needs from?
39. Why are projections of energy supply and demand so difficult to make? What factors are involved?
40. What are the main types of fossils fuels? How does each type form?
41. What are the four types of coal?
42. Be able to discuss the environmental impacts of coal exploration, mining and production.

43. What are some environmental issues with the burning of coal? The transportation of coal?
44. What are hydrocarbons?
45. What is the oil window?
46. What is “CAI”? How is it used in petroleum exploration?
47. Which countries produce the most oil and natural gas? Which use the most of this resource?
48. What are the three parts of the petroleum system? What physical/chemical properties must each part have?
49. Be able to describe the geology of various hydrocarbon traps.
50. What is Peak Oil? What will be the major effect once this milestone is reached?
51. What is primary production? Secondary and Tertiary production? What methods are used in each?
52. What are the environmental impacts associated with the exploration and production of hydrocarbons?
53. Be able to describe oil shales and tar sands and how hydrocarbons are produced from these resources.
54. What is the connection between fossil fuels and acid rainfall?
55. Be able to describe/discuss nuclear fission.
56. What are the geologic sources of uranium ores?
57. What are some environmental issues with nuclear reactors?
58. What is nuclear fusion? Is it a current energy option? Why or why not?
59. What is the geothermal gradient? What is the typical value for continental areas?
60. Be able to describe the various geothermal systems (p.459-463)
61. What are some environmental impacts associated with the use of geothermal resources?
62. Which resource has the most overall energy potential: fossil fuels or geothermal?
63. What are the five forms of renewable energy described in your textbook? Be able to describe each in detail.
64. Why are conservation, efficiency and cogeneration important to the future of energy use on Earth?
65. What are the “hard path” and “soft path”?
66. What are some of the keys to a sustainable energy policy?