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I. INTRODUCTION

Energy availability, now and for the future, is a critical concern in America today. The United States has been involved in an ongoing war with itself concerning energy usage and production since about 1950. It now appears to be losing. Prices for energy have risen with inflation. Supplies and recoverable resources are dwindling. Twice since 1973 the country has witnessed the frustration of waiting in long lines at gasoline stations. The United States today relies heavily upon imported oil for energy needs. It is thus at the mercy of political and social occurrences beyond its control. Foreign oil has become so important that the government is apparently willing to go to war to protect it.

Demand for energy in the United States in the year 1900 was about ten quads.[1] By 1970 it had increased to approximately sixty quads, and should exceed ninety quads this year.[2] Current reserves are estimated to be 5,729 quads, of which coal accounts for nearly eighty percent.[3] It is clear that coal is our most abundant resource and will have to play a key role in future energy policies.

The energy shortage has arisen in large part because of the way in which the country uses its supplies. Oil and gas account for approximately

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On June 30, 1980, President Carter signed into law a bill creating the United States Synthetic Fuels Corporation (Pub. L. 96-294), discussed under the name of the Energy Security Corporation in Section III(A) of this article. The corporation will manage the $20 billion earmarked to help develop the synthetic fuels industry by giving loans, loan guarantees, price guarantees, and purchase guarantees.

Three days earlier, however, the House of Representatives voted to recommit to the Conference Committee legislation which would create the Energy Mobilization Board, also discussed in Section III(A) of this article. There is still time for the Energy Mobilization Board legislation to be reworked by the Committee and passed prior to the fall 1980 adjournment of Congress. The possibility of that occurrence appears highly unlikely, however. The reader should nonetheless be familiar with the concepts involved because it is probable that some sort of legislation for expedition of energy projects will be enacted in the near future.

1. McGee, *Diversification of Energy*, 7 EXPLORATION & ECON. PETROLEUM INDUSTRY 1, 7 (1969). A "quad" represents one quadrillion BTUs, a measure of heat output.

2. *Id.*

3. Moyer, *The Role of Coal: Problems and Policies*, 18 NAT. RESOURCES J. 761, 765 (1978). Moyer notes the breakdown of recoverable reserves as estimated by the National Coal Association to be as follows: coal - 4557 quads; petroleum - 197 quads; natural gas - 258 quads; natural gas liquids - 26 quads; oil in bituminous rocks - 7 quads; shale oil - 450 quads; and uranium oxide - 234 quads.

seventy percent of the American energy usage.[4] This figure is not likely to decrease. In fact, the United States will undoubtedly continue to be dependent upon oil and gas into the next century. Where does that leave a nation whose needs are based directly upon what it has the least of in energy terms? It obviously puts the country in the position of a net importer. But, even the supplies which are imported may not allow the U.S. enough for its current demand. Studies indicate a future need for synthetic liquid and gaseous fuels.[5] To alleviate this problem, President Carter has stated a strong desire to develop synthetic fuels (synfuels) as one solution to current high energy demands.[6]

There are many types of synthetic fuels made from various minerals. The focus of this article will be synthetic gaseous fuel, specifically High-BTU Synthetic Gas (HBSG) derived from coal. The development of this "new" energy source brings with it significant issues, legal and otherwise, in a multitude of areas. These issues can be found from the mining of the coal to be processed to the closing of the plant facility. The issues may include, among others, environmental, social, economic, technical, health, and, of course, legal.

It is the legal issues surrounding the development of synfuels, primarily HBSG, which will be the focus of this article. Initially the nonlegal aspects of the process itself will be discussed and analyzed. Then will follow a brief analysis of legislation designed to, among other things, promote the development of synfuels. These are the acts establishing the Synthetic Fuels Corporation and the Energy Mobilization Board. Then the article will turn to legal issues dealing with actual location of synfuel plants. Particular attention will be paid to environmental legislation, such as the Clean Air Act and the Clean Water Act. Water supply and general land use issues will be noted also. The thesis of this article is that synfuel development should be rational. It should not be a program which ignores the demands of the people and environment most directly affected. The value of this energy source can be more readily realized if developers are fully cognizant of the legal and nonlegal issues present.[7] This article therefore exposes the most significant legal issues confronting the synfuel industry and its opponents.

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4. *Department of Energy Fiscal Year 1979 Authorization. Hearings on S.2692 and S.2693 before the Subcomm. on Energy Research and Development of the Senate Comm. on Energy and Natural Resources*, 95th Cong., 2d Sess. 53 (1978) (statement of George Fumich, Jr.) [hereinafter referred to as *1979 Authorization Hearings*].

5. *See, e.g.*, Mills, *Coal and Shale — Alternative Fuels for the Midterm*, 16 EXPLORATION & ECON. PETROLEUM INDUSTRY 229 (1978).

6. Speech delivered to the nation by President Jimmy Carter (July 15, 1979).

7. The authors of this article will not attempt to editorialize on the value of synfuels over other forms of energy. Comparisons to some conventional energy sources will be made solely to form a reference point for synfuel data presented. The authors themselves are actually not in agreement as to the appropriate energy policy approach for the nation, particularly with regard to solar energy development and conservation measures. The purpose here, however, is to present and analyze the legal issues associated with and arising out of development of a coal gasification plant.

II. GAS FROM COAL: THE PROCESS AND PROSPECTS

A. *General Considerations*

The need for supplemental supplies of gas that have properties equivalent to those of natural gas (substantially all methane) is well documented.[8] U.S. reserves of natural gas will soon be less than adequate.[9] Part of this problem is due to price regulation which has made domestic exploration for new fields less than profitable.[10] In addition, the artifically low cost of gaseous fuels hampered profitable development of new technologies. However, diminished supplies of oil and natural gas should soon lead us to a point where new technological development will be cost efficient. It has been stated that we are entering a transition period between an era of cheap energy and a future of solar and hydrogen power.[11] The key to this transition period is coal. One critical use of coal is for HBSG.

There are five major coal producing regions of the country.[12] Each is capable of supplying the coal necessary for a synfuel program over the economic life of such a program. These areas include: the Appalachian Region, located in West Virginia, Pennsylvania, Ohio, and Kentucky; the Eastern Interior Region, located primarily in Illinois and Indiana; the Powder River Region, located in southeastern Montana and northeastern Wyoming; the Fort Union Region, located in northeastern Montana and western North Dakota; and the Four Corners Region located in southwestern Colorado and northwestern New Mexico.[13] The United States has total coal reserves, both identified and postulated, of approximately 3,000 billion tons, of which about 2,000 billion tons could be obtained through mining.[14] Placing the current annual national usage of natural gas at approximately 25 trillion cubic feet, the above figure would convert to 1,280 years' supply of synthetic gas from coal.[15] However, the actual amount of coal which could be mined within current economic and technical constraints is approximately 437 billion tons.[16] Obviously not all of this can be directed to an

8. Schora, Berkowitz, Hegarty, *et al.*, Fuel Gases from Coal (1976).

9. *Introduction to Symposium on Energy Issues and the Legal System*, 11 CONN. L. REV. 367, 370 (1979).

10. The Natural Gas Policy Act of 1978, 15 U.S.C. § 3301 (Supp. II 1978) should alleviate some of the price constraints to HBSG development. The Act provides for gradual decontrol of natural gas pricing by the federal government. The ultimate goal is no price controls at all. For analysis of problems and pitfalls associated with the Act see, Morgan, *Application and Enforcement of the Natural Gas Policy Act of 1978: Administrative and Legal Problems*, 25 ROCKY MTN. MIN. L. INST. 13-1 (1979); Comment, *For Gas, Congress Spells Relief N-G-P-A: An Analysis of the Natural Gas Policy Act of 1978*, 40 U. PITT. L. REV. 429 (1979).

11. *ERDA Fiscal Year 1978 Authorization; Hearings on S.1340, S.1341, and S.1811 Before the Subcomm. on Energy Research and Development of the Senate Comm. on Energy and Natural Resources*, 95th Cong., 1st Sess. 1460 (1977) (statement of John McCormick) [hereinafter cited as *1978 Authorization Hearings*].

12. ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR ALTERNATIVE FUELS DEMONSTRATION PROGRAM S-4 (1977) [hereinafter cited as SYNFUEL EIS].

13. *Id.*

14. Cochran, *Conversion of Coal to Oil and Gas*, 10 EXPLORATION & ECON. PETROLEUM INDUSTRY 169 (1972).

15. *Id.* at 170.

16. SYNFUEL EIS, *supra* note 12, at XI-2.

HBSG program.

These coal reserves should satisfy much of our energy requirement between 1985 and approximately 2020.[17] However, efforts in this direction will be affected by the constraints of the Clean Air Act.[18] One way to significantly increase coal usage without a significant increase in pollution is through utilization of HBSG. Generally this process involves the reaction of coal at high temperatures in an atmosphere deficient in oxygen to produce a combustible gas.[19] This yields methane, basically indistinguishable from natural gas. Essentially the process takes a solid, dirty, inconvenient-to-transport product and changes it into a clean burning, readily transportable and easily stored energy source. As will be seen, there are economic and legal obstacles to full-scale development. However, before discussing those factors, an understanding of the technology involved is necessary.

B. *Technology*

The technology for converting coal to gas has been known since 1926.[20] The synthetic gas technology was developed in Germany prior to World War II and was used to produce synthetic fuels for that country. The technique was the Lurgi process and is currently utilized in South Africa.[21] Much of the early development efforts focused on Medium-BTU (MBSG) or Low-BTU synthetic gasification (LBSG). Both technologies consist mainly of hydrogen and carbon monoxide and have a heating value of 300 BTU/cubic foot or lower. The most recent technological developments are in the area of HBSG, which, as noted above, is almost entirely methane.[22] It is pipeline quality gas. HBSG can be commingled with natural gas and transported economically in pipelines in excess of 1,000 miles.[23] Medium and Low-BTU gas, on the other hand, can only be economically transported by a separate pipeline and only about a distance of 200 miles.[24] HBSG can be used for commercial or domestic use; MBSG or LBSG are suitable only for commercial and industrial use.[25]

The commercial HBSG plant should be large enough to take advantage of economies of scale.[26] The general technological goals which the synfuels industry has set for HBSG are to develop transferable technology that will convert domestic coal into substitute natural gas of pipeline quality, with heating value of 950-1000 BTU/cubic foot, in an environmentally safe and

17. *1979 Authorization Hearings, supra* note 4, at 834 (statement of G. Lawrence).
18. 42 U.S.C. § 7401 (Supp. II 1978).
19. NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH, U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, OCCUPATIONAL EXPOSURES IN COAL GASIFICATION PLANTS 105 (1978) [hereinafter cited as NIOSH].
20. McGee, *supra* note 1, at 15.
21. Swabb, *Coal Gasification and Liquefaction in Perspective*, 16 EXPLORATION & ECON. PETROLEUM INDUSTRY 257, 263 (1978).
22. *1978 Authorization Hearings, supra* note 11, at 1504.
23. *Id.*
24. *Id.*
25. *Id.*
26. NIOSH, *supra* note 19, at 115.

economically sound manner.[27] The general concept of generating gas from a heated particle of coal is relatively simple. All that is needed is carbon, hydrogen, and oxygen.[28] Coal provides the carbon, steam provides the hydrogen, and the oxygen comes from the air.[29]

The production of the end product is a bit more involved. The Lurgi process, which is currently the most utilized, involves approximately thirteen steps. Included are coal handling, coal preparation, coal feeding, coal gasification, ash removal, quenching, shift conversion, gas cooling, gas purification, methanation, sulfur removal, byproduct storage, and cleanup.[30] The process will be either fixed-bed or fluidized-bed in nature. The fixed-bed is primarily used for processing of noncaking coals. In this process crushed coal is fed into a pressure gasifier where gasification takes place at 350 to 450 pounds per square inch of pressure. Steam and oxygen are introduced below a grate at the bottom of the gasifier. The grate is rotated and ash is collected in a hopper. Gasification temperatures range between 1150° and 1400°F with residence time of one hour. Crude gas leaves the gasifier at between 700° and 1100°F.[31] Varying percentages of tar, oil, naptha, penols, and ammonia must all be removed through further processing of the gas.[32]

The fluidized-bed process adds a step at the beginning. The coal is pretreated to destroy any caking qualities. This means more types of coal can be utilized. Under this technique crushed and dried coal is fed to the fluidized-bed pretreater. About twelve percent of the total steam and oxygen required is fed to the pretreater, which operates at 800°F. Coal, along with separated volatile matter and excess steam, is fed to the top of the gasifier. Steam and oxygen are introduced at the bottom. The gasifier operates at 1800°F and 500 to 1000 pounds per square inch pressure. Char and ash are removed from the bottom and raw gas leaves the top.[33]

Both fixed-bed and fluidized-bed have their advantages and disadvantages upon comparison. Fluidized is generally more costly in terms of energy usage and requires a significantly greater amount of water and oxygen. However, it allows all types of coal to be utilized and produces fifty percent of the HBSG in the first step, thus decreasing the amount of processing needed in the methanation stage.[34]

The techniques being developed for future use, "third generation" processes, will utilize a spray catalyst solution. This solution will be sprayed on the coal prior to feeding it into a fluidized-bed reactor at only 1300°F. The synthetic natural gas is made directly. This process is much lower in cost than existing technology.[35] The efficiency of this process is also greater.

27. *1979 Authorization Hearings, supra* note 4, at 113.

28. YOUNG, NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH, U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, POTENTIAL HEALTH HAZARDS INVOLVED WITH COAL GASIFICATION 86 (1978) [hereinafter cited as HAZARDS].

29. *Id.*

30. NIOSH, *supra* note 19, at 19.

31. SYNFUEL EIS, *supra* note 12, at II-8.

32. *Id.*

33. *Id.* at II-9.

34. *Id.* at II-8,9.

35. Swabb, *supra* note 21, at 265.

A final note on these technologies is in order at this point. All of these processes use water in one or more parts of the process (*e.g.*, washing coal, cooling, pollution control). Research is currently underway to develop plants which would recirculate the water within a plant, the ultimate goal being zero discharge. This would help to solve two problems, pollution and conservation of water.[36] These are particularly critical problems in the western part of the United States.

C. *The Resources*

Coal obviously is the main ingredient in HBSG. Types of coal and coal content differs from region to region, and even within regions. It is not a single material, but rather is a family of related materials, differing widely in heat content, contaminants (*e.g.*, sulfur and ash), and physical properties (*e.g.*, caking and hardness).[37] It is generally ranked according to volatile matter and heat content (BTU/pound). These rankings work from low rank lignite through subbituminous and bituminous to high rank anthracite.[38] Anthracite is the hardest, most dense, and therefore contains less water. The lower the percentage of water content the greater amount of heat generated per pound when the coal burns.[39] Approximately seventy percent of our U.S. coal reserve is bituminous or subbituminous, while only one percent is anthracite.[40]

As was noted earlier, some processes cannot utilize caking bituminous coals found extensively in the eastern half of the country.[41] When heated, this coal forms "a sticky, lumpy mass, which subsequently becomes hard" when it cools.[42] It tends to clog and generally causes problems in the gasification process. A plant using these coals with caking properties will have to pretreat the coal in order to offset these tendencies.

The total amount of coal needed for the projected HBSG program for 1985 has been measured in different ways. One method is to compare to equivalent barrels of oil per day. If the plants produced approximately 350,000 barrels of oil per day, 690 million tons of coal would have to be committed over a twenty year projected life span for the plants. This represents about 3/10 of a percent of the total, currently recoverable reserves in the five coal regions.[43] If the plants produced one million barrels per day, 2.98 billion tons of coal would have to be committed over a twenty year period. This represents about 1.2% of recoverable reserves.[44] One million barrels per day is generally considered to be about the maximum projected

36. SYNFUEL EIS, *supra* note 12, at IV-32.
37. Mills, *supra* note 5, at 231-32.
38. NIOSH, *supra* note 19, at 111.
39. Swabb, *supra* note 21, at 258.
40. HAZARDS, *supra* note 28, at 10.
41. FEDERAL ENERGY ADMINISTRATION & U.S. DEPARTMENT OF INTERIOR, *Final Task Force Report—Project Independence Blueprint* 117 (1974) [hereinafter cited as PROJECT INDEPENDENCE].
42. Swabb, *supra* note 21, at 259.
43. SYNFUEL EIS *supra* note 12, at XI-2.
44. *Id.*

production for 1985.[45]

In addition to coal, the gasification process is also a heavy user of water, both as a raw material and as a cooling and cleaning ingredient. The higher the BTU involved, the greater is the water requirement.[46] It should also be noted that water requirements for each region will be different. In the Appalachian and Eastern Regions, where more plants will be located, water requirements are approximately 70,605 tons per day for fixed-bed gasifiers and about 130,000 tons per day for fluidized-bed gasifiers.[47] In the Powder River, Fort Union, and Four Corners Regions, the raw water intake for fixed-bed units would be approximately 30,000 tons per day and roughly 60,330 tons per day for fluidized-bed operations.[48] Water appears to be available in sufficient quantities for both the Appalachian and Eastern Regions. The three western regions, however, are far more arid and suffer from uncertainties about Indian water rights, federal government rights, and the amount of water represented by presently existing rights. The Four Corners Region suffers particularly from low annual flows which could hamper HBSG development.

If water is to be obtained in the western areas, the rights most likely will have to be obtained from farmers or others who use substantial quantities for irrigation. In these regions, approximately ninety percent of the water is used for irrigation purposes.[49] Conflict may occur over these rights since low flow usually occurs at a time when irrigation requirements are at their height. Constraints on water will be further tightened by the fact that water will also be required for developments accompanying synfuel production, for the population influx associated with the development, and, in the western portion of the country, for reclamation purposes. It is clear that for a number of the regions, careful study of the water requirements and water availability will have to be done to determine the feasibility of plant siting.

Because of the water problems, it would appear that the best place to site the first plants would be in the East and Midwest. A further reason to encourage development in those areas would be the high number of people who would benefit readily from the gas produced. The trade-off is that seventy percent of the coal east of the Mississippi River is high in both sulfur and caking properties.[50] A solution to this might be to transport western coal, low in both sulfur and caking properties, to the East. However, western coal is also composed of a high percentage of both water and ash, which makes it uneconomical to transport in a raw state. It may be possible in the future to process the coal and remove most of the ash, thus making it economical to transport it to HBSG sites in the East.[51]

Yet another resource problem associated with HBSG plants is the effluents produced during the gasification process. These effluents and the final

45. *Id.*
46. PROJECT INDEPENDENCE, *supra* note 41, at 88.
47. SYNFUEL EIS, *supra* note 12, at IV-30, 31.
48. *Id.*
49. *Id.* at III-168.
50. *1979 Authorization Hearings, supra* note 4, at 50.
51. *Id.*

byproducts will have to be treated so as to minimize any effect on the environment. While this subject will be dealt with further below, it is important to note the effluents in the HBSG process. The major pollutants will include sulfur oxides, nitrogen oxides, particulates, hydrocarbons, carbon monoxide, and aledehydes.[52] Most of these are produced in the gasifier, and subsequent reactions during the process will destroy the bulk of these substances.[53] In addition, materials known to be hazardous to human health, such as chrysene, are likely to be produced during the plant operation.[54] Liquid byproducts, ammonia, and raw materials for the process may be shipped to and from the site by rail and truck. A coal feed rate of 22,000 tons per day would yield about 145,000 gallons per day of liquid byproducts.[55] Storage of some of this material might be possible, but the majority of the liquid effluent would have to be treated in on-site waste water treatment facilities. A plant may be designed to eliminate most water discharge, but under this system solid waste would increase directly.[56] If a coal mine is contiguous or nearby, one method of solid waste disposal might be to bury the material at the mine site.[57] The land used, in addition to deep mine burial for disposal of ash and other waste, would not be suitable for agricultural purposes. In some instances this may, as noted below, cause conflict with the Surface Mining and Reclamation Act.[58] The land may, however, be suitable for industrial facility siting or recreational purposes. The estimated amount of solid waste generated would be about 14.8 million tons per year, or about 296 million tons over the twenty year life of an HBSG plant.[59]

D. *Economics*

The major reason the United States does not currently have an HBSG plant in commercial operation is because the end product would be too expensive. It could not compete with the current cost of regulated natural gas.[60] However, this picture is rapidly changing due to government policies,[61] legislation,[62] and foreign political maneuvering.[63] The question has changed from *if* HBSG will be produced, to *when* it will be produced.

To the detriment of HBSG development, the pricing of natural gas is, and has been, a political issue. The current and past prices of natural gas

52. SYNFUEL EIS, *supra* note 12, at S-18.
53. *Id.*
54. *Id.*
55. NIOSH, *supra* note 19, at 31.
56. SYNFUEL EIS, *supra* note 12, at IV-37.
57. *Id.*
58. 30 U.S.C. § 1201 (1979).
59. SYNFUEL EIS, *supra* note 12, at XI-11. This solid waste may well be subject to severe regulations and restrictions pursuant to the Resource Conservation and Recovery Act (RCRA) 42 U.S.C. § 6901 (Supp. II 1978), and recently promulgated Environmental Protection Agency (EPA) regulations implementing RCRA, 45 Fed. Reg. 12,722 (1980)(to be codified in 40 C.F.R. § 260).
60. SYNFUEL EIS, *supra* note 12, at S-1.
61. The Carter Administration favors decontrol of energy prices generally.
62. Natural Gas Policy Act, 15 U.S.C. § 3301 (Supp. II 1978).
63. Current difficulties in the Middle East, attempts to purchase Mexican natural gas, and arrangements with Canada for a pipeline to transport Alaskan natural gas all have an impact on the current market.

have a direct relationship with the point when HBSG becomes profitable to produce. Until about 1978 the energy policy in this country was basically to keep the cost of energy to the consumer at the lowest possible levels. For nearly thirty years the Federal Power Commission[64] set the price of natural gas at artificially low levels in the belief that it was providing protection for the consumer.[65] This policy greatly increased demand for a product which began to be in short supply. As documented elsewhere, legislation was passed by Congress in 1978 which requires a phasing out of price controls on natural gas over a several year period.[66] The end result of this policy will, of course, be higher natural gas prices. Such action will bring HBSG much more competitively into the picture. Energy shortages also work to increase and hasten the viability of HBSG.

Presently the actual development of HBSG industry is being funded by the federal government, as well as private corporations. The combination of the extremely high cost of the plants and the difficulty industry has had in obtaining financing has led to the partnership with the federal government. Each plant is estimated to cost in excess of one billion dollars, which exceeds the net worth of all but the largest natural gas companies.[67] Private lending institutions have been concerned about financing these plants because of the risks involved. Many uncertainties exist with regard to legal hurdles, government regulation, and the fact that plants of this size have not been built anywhere previously. Private lenders could be left holding a one billion dollar white elephant if something should go wrong.

Because of the public interest at stake, the government has felt it necessary and appropriate to take part in this development process. Presently the American Gas Association and the Department of Energy (DOE) are jointly financing several development projects. Private financing may become more available as the process is refined and risks go down. If the Synthetic Fuels Corporation (SFC) legislation works to the satisfaction of Congress, necessary financing and incentives will become more available.

The incentives which are preferred by private industry fall into four basic categories: (1) free-market price for the products, (2) investment tax credits, (3) rapid depreciation, and (4) a cash grant convertible to a loan.[68]

The funding for fiscal year (FY) 1979 for coal gasification by DOE was $186,646,000.[69] Previously, FY 1978 funding had been $212,000,000.[70] At the time it was stated that the reduction was due to changes in emphasis

64. The responsibilities of the Federal Power Commission have been assumed by the Federal Energy Regulatory Commission under The Energy Reorganization Act of 1977, 42 U.S.C. §§ 7171, 7172 (Supp. II 1978).

65. Cochran, *supra* note 14, at 41.

66. *See* note 10 *supra*.

67. *1978 Authorization Hearings, supra* note 11, at 1502. (statement of American Gas Association).

68. Swabb, *supra* note 21, at 271. See Part II of this article for structure and analyses of the Energy Security Corporation legislation which will govern the financing of snyfuel plants for the future.

69. *1979 Authorization Hearings, supra* note 4, at 128 (Appendix I).

70. *Id.* at 820.

rather than decrease in support.[71] It was argued that several of the HBSG "pilot plants" were nearing the end of their operating schedules, thus necessitating a decrease in funding.[72] The SFC legislation clearly represents a turn around in funding intensity. While not as high as President Carter desired, the legislation clearly indicates a new congressional emphasis on HBSG development.

E. *Sociological Impacts*

The sociological effects of the HBSG program will be many and varied. Each specific plant will have an impact in the areas surrounding it and could have an indirect effect on other areas. Where multiple plants will be sited in specific regions the effects will, of course, be more pronounced. The influx of large numbers of people into a region as a result of HBSG development will be one influencing factor. It is estimated, for example, that HBSG development is likely to cause a two percent increase in population in the Eastern regions.[73] By contrast, development in the West could result in increases up to seventeen percent.[74] In actual numbers this could mean permanent regional population increases of up to 68,000 persons in the Appalachian region, 54,000 in the Eastern Interior, 24,000 in the Powder River, 26,000 in the Fort Union, and 19,000 in Four Corners.[75] Most of these population increases would be the result of construction personnel and later on, operation personnel. Associated population increase would also occur in the form of families of the above workers, health care specialists, other industries, commercial figures, and others. The population associated with HBSG development would increase rapidly during the construction period before stabilization during the operational phase.[76] There would be an increase of approximately 8,000 during construction and a drop to about 3,400 in the operational phase.[77] The emigration of a new industry into a given area would cause a shift of labor from one region of the U.S. to another. This would increase the "gross regional product" of one region and possibly reduce the regional product of another.[78] Such a shift could also relieve unemployment, welfare roles, and overcrowded conditions in other regions.[79]

Land requirements for each plant would include not only that land for the plant complex, but also land for housing, recreation, and open space. A

71. *Id.* at 129.

72. *Id.* at 129. It might be noted that at the time the 1979 authorizations were being debated the various plants were in the following stages:

Pilot Plant, Chicago, Illinois—Operational
Pilot Plant, Homer City, Pennsylvania—Operational
Pilot Plant, Bruceton, Pennsylvania—
Pilot Plant, undertermined—Design
Pilot Plant, undertermined—Design
Demonstration Plant, undetermined—Design

1979 Authorization Hearings, supra note 4, at 73.

73. SYNFUEL EIS, *supra* note 12, at S-22.

74. *Id.*

75. *Id.*

76. *Id.* at IV-54.

77. *Id.*

78. *Id.* at VII-38.

79. *Id.* at S-23.

community near a HBSG plant should plan on needing at least 300 acres for housing developments and another thirty acres for recreational needs.[80]

Rapid influxes of people into an area will add to inflation, social tension and a shortage of housing and necessary public services and facilities. There is, of course, the possibility of severe social problems if the influx of people is different from the existing population in terms of race, age, ethnicity, occupation and income.

The so called boom town syndrome has been seen at various times in this country's history, often bringing with it some of the problems noted above. In the past decade several communities in the West have become energy boom towns. In fact Wyoming has what might be termed a boom county, Sweetwater County. Within this county are the towns of Green River and Rock Springs. The population of the county primarily in these two communities, doubled during the four year period of 1970-1974.[81] Housing shortages and school impacts were severe. This area's problems with crime and corruption have been thoroughly documented by the news media. It is merely the most sensational of the boom areas.

The Green River-Rock Springs area is typical of energy boom towns in that it is predominately a rural area. If energy concerns were to construct an HBSG plant in more heavily populated Eastern areas the impact would not be nearly so substantial. It has been estimated that the most communities can annually absorb is about a five percent population growth. Problems begin to arise when the growth rate approaches fifteen percent.[82] A regional population increase of 68,000 persons in the Appalachian region will have far less impact than 19,000 additional persons on the Four Corners Region.[83]

Underpopulated rural areas generally are not equipped to cope with the boom. The property taxes to be paid by an HBSG plant operator may not be sufficient to pay for the community needs generated by the construction of the plant. The facilities of this nature bring with them uncertainty and transiency.[84] Most construction workers and support personnel will move on following completion of the plant. Studies of boom towns have shown high rates of divorce, drug use, alcoholism, and suicides.[85] Performance by school children is below the norm and deliquency and truancy rates are above average.[86] Generally, rural communities are homogeneous and relatively conservative. The population coming into such an area as the result of energy development will be substantially more diverse and liberal.[87] The boom communities have generally been termed a "bad place to live . . . . [and] a bad place to do business."[88] The situation in these communi-

80. *Id.* at IV-58.
81. Daley, *Financing Housing and Public Facilities in Energy Boom Towns*, 22 ROCKY MT. MIN. L. INST. 47, 50 (1976).
82. Little, *Some Social Consequences of Boom Towns*, 53 N.D.L. Rev. 401, 402 (1977).
83. *See* text accompanying note 74 *supra*.
84. *See generally* Little, *supra* note 82.
85. *Id.*
86. *Id.*
87. *Id.*
88. *Id.* at 401 (quoting Gilmore, *Boom Towns May Hinder Energy Development*, 191 SCIENCE 535 (1976)).

ties could well hit a low point after plant construction and particularly toward the end of the plant's life, as phase-out approaches.[89]

F. *Environmental and Health Effects*

HBSG plants will not be without environmental and health impacts. The legal restraints and issues will be dealt with below, but a brief summary of these effects is in order here. The primary health hazards of HBSG are most likely to be localized. There will also be some hazardous conditions for construction workers during the construction phase and employees during actual operation of the plant.

Air quality will naturally be affected, as with any other use of fossil fuel techniques. While the emissions from the standard size HBSG plant will not be as substantial as from a coal-fired power plant, they will be significant. Emissions will trigger the preconstruction review procedures for prevention of significant deterioriation (PSD) under the Clean Air Act[90] or the offset requirements for nonattainment areas under the same act.[91] The major pollutant emitted from an HBSG plant is sulfur dioxide (SO_2). The amount of SO_2 under controlled (usually the use of flue gas desulfurization or scrubbers) conditions will amount to less than one-tenth of the emissions from a coal-fired power plant.[92] This should not be enough to violate the National Ambient Air Quality Standards (NAAQS). There will also be less significant emmissions of nitrogen oxides (NO_x) and hydrocarbons (HC). Emissions of particulates and carbon monoxide will be negligible.[93] Other significant air quality impacts will come from development related to the construction and operation of a coal gasification plant. Expansion of nearby towns, road construction and intensified mining activities will be likely to increase peak-ground level particulates, NO_x and HC.[94]

Effects on water quality will be more significant than those from air quality.[95] As noted elsewhere water quantity will be a major problem for western development and should be considered in conjunction with water quality analysis. Water quality problems will affect all HBSG plants, though some will be more intense than others. Water pollutants from a typical HBSG plant will include dissolved solids, suspended solids, nondegradable organic compounds, and will contribute to salinity and pollutant

89. *Id.*

90. 42 U.S.C. § 7470 (1977).

91. 42 U.S.C. § 7501 (1977).

92. Energy from the West, Impact Analysis Report (Vol. 1), *Interagency Energy/Environment R&D Program Report*, at 52 (1979). [hereinafter cited as Energy from the West]. The actual figures are, on the basis of pounds per hour, as follows: 1) Lurgi coal gasification process -520 pounds/hour and 2) coal fired power plant (assuming scrubbing) -5,800-14,000 pounds per hour. Phrased in another way the Lurgi process would have emissions of .05 pounds per million BTUs heat output. Under recently issued New Source Performance Standards for coal fired power plants under the Clean Air Act the maximum a new plant can emit is 1.2 pounds per million BTUs. Some older power plants are currently emitting up to 10 pounds per million BTUs.

93. *Id.*

94. *Id.* at 60.

95. SYNFUEL EIS, *supra* note 12, at IX-2.

concentrations downstream from the point of the water diversion.[96] In the West it is likely efforts will be made to keep water discharges to a minimum, perhaps even zero, in order to conserve water. But this adds to consumptive use and related hardships and legal confrontations.[97] Zero discharge will also create a significant solid waste problem.[98] Finally, related developments will, just as with air pollution, add to water quality problems. Increases in population of nearby towns will contribute to additional salts, nutrients, organic materials, bacteria, fertilizers, and pesticides.[99] There will also be significant overloading of existing sewage treatment facilities in the towns near the plants.[100]

As noted above there will be a significant solid waste problem. Generally the wastes generated will fall into three categories - ash, tar, and elemental sulfur.[101] Disposal of solid wastes may result in the covering of productive soil.[102] Ash, once thought to be innocuous, is now suspected of carrying undesirable components which are capable of leaching into groundwater.[103] Tar and oil contain known carcinogens and thus are very hazardous.[104]

HBSG plants will have substantial land use impacts, both at the plant site and in related activities. The needed coal will either be surface or deep mined. Both processes have adverse effects on the land. In the West surface mining will be required for most of the coal recovery operations. This can utilize as much as ten times more land than required for deep mining.[105] Land will be required for the plant itself. In order to transport the coal to the plant, land will be used for either roads, railroad spurs, or coal slurry pipelines. Gas pipelines will be necessary to transport the finished product to its end destination. In the nearby towns land will, of course, be required for housing needs, recreational uses, and support industries.

The largest obstacles for development of HBSG plants are political, financial, and legal. Discussion of these follows.

III. LEGAL BARRIERS AND BOOSTERS

A. *Federal Financial and Procedural Assistance*

The major financial, political, and legal issues surrounding development of a synthetic fuel plant may well be taken care of in the future by two pieces of legislation. This legislation would create the Synthetic Fuels Corporation (SFC) to aid in financing plants and an Energy Mobilization Board (EMB) to aid developers in overcoming legal and political obstacles.[106]

96. *Id.*
97. See discussion of water rights issues in text accompanying notes 224-38.
98. SYNFUEL EIS, *supra* note 12, at IV-34-36.
99. *Id.* at IX-2.
100. *Id.*
101. National Energy Plan II, II-36 (1979).
102. SYNFUEL EIS, *supra* note 12, at IX-3.
103. National Energy Plan II, *supra* note 101, at II-36.
104. *Id.*
105. Energy From the West, *supra* note 92, at 118.
106. As of this writing, the Senate and the House have passed the bill creating the Synthet-

Both concepts were proposed by President Carter in his July 15, 1979 national energy policy address. Both concepts had, however, surfaced earlier in Congress. Essentially President Carter proposed the creation of the SFC to lead an effort of replacement of two and one half million barrels of imported oil per day.[107] The President asked for $88 billion for the synthetic fuels program. The proposal called for the SFC to be an independent, government sponsored entity managed by a seven-member board. The board would include, among others, the Secretary of Energy, the Secretary of the Treasury, and one other Cabinet level chief.[108] The President envisioned that the board would decide how to invest the $88 billion and might even develop synfuel plants to be owned and operated by the government.[109] In should be noted that not all of this money was earmarked for coal gasification facilities.

In addition to the SFC, President Carter called for the creation of the EMB in order to make sure that nothing would stand in the way of the work of the SFC and private enterprise. The purpose behind the EMB was to alleviate delays which have historically occurred with energy related projects due to local, state, and federal land use and environmental regulations and statutes. The President's concept was to have a three-member board which would be part of the Executive Office of the President and would have the authority to designate nonnuclear projects as priority energy projects.[110] The EMB could then set a deadline by which all responsible officials and decision makers would have to act. If there were a failure to comply with the timetable, the Board would be empowered to make the decision.[111] The President proposed that the Board would have the authority to waive procedural requirements of applicable federal, state, and local laws, was well as procedural and substantive laws enacted after construction had begun.[112] The President stated: "We will protect the environment. But when this nation critically needs a refinery or pipeline, we will build it."[113]

Congress responded to the President's charge by moving ahead with consideration of similar legislation already introduced. After much debate and political maneuvering, the Senate passed a bill on October 4, 1979, which creates a four-member Energy Mobilization Board.[114] The Board could set deadlines for various agencies to act. It could alter or waive procedural rules, but not substantive ones.[115] If a deadline was missed, the Board would be empowered to make the decision. Finally, a waiver of legislation or regulations passed after commencement of construction is possible.[116]

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ics Fuel Corporation. The present bill authorizes $20 billion to stimulate the production of synthetic fuels from coal and oil shale. On June 27, the House voted 232-131 to send the bill creating the Energy Mobilization Board back to the Senate-House Conference Committee.

107. CONG. Q. WEEKLY 1437 (July 21, 1979).
108. *Id.*
109. *Id.*
110. *Id.* at 1437-38.
111. *Id.* at 1438.
112. *Id.* at 1438-39.
113. *Id.* at 1472.
114. S. 1308, 96th Cong., 1st Sess. (1979).
115. 37 CONG. Q. WEEKLY 2187 (Oct. 6, 1979).
116. *Id.*

On November 1, 1979, the House of Representatives also passed legislation creating an Energy Mobilization Board.[117] The House version sets up a five-member panel, also having the authority to act in place of local, state, or federal officials failing to make a timely decision.[118] The House-created EMB would have the power to waive substantive federal law if the President and both houses of Congress agreed to such a waiver.[119]

The two measures are currently before a Conference Committee which is deadlocked over one key issue. The conferees are, as of this writing, unable to agree on the waiver of substantive laws issue. A limited "grandfather Clause" allowing exemption from federal, state, or local laws or regulations passed after construction has started has been agreed to by the conferees. The length and reviewability of these waivers has not been agreed to.[120] It will apparently be several months before a finished bill emerges. It is clear that some sort of EMB will be authorized and will have an impact on energy development. It is likely that some HBSG plants will be affected by the EMB and may escape some of the legal obstacles noted elsewhere in this part of this article.

Following President Carter's July speech, both houses accelerated work on legislation to aid in the financing of synfuel programs. The House has passed one measure authorizing $3 billion in price supports for synfuels prior to the July speech.[121] It quickly became clear that while Congress agreed that financial assistance was needed for synfuel development, neither house felt it appropriate to authorize anywhere near the amount of money which President Carter had proposed. On November 8, 1979, the Senate passed a bill authorizing a five-year, $20 billion synfuel program.[122] This bill creates a synthetic fuels corporation to manage the program. A Conference Committee has formally approved this aspect of the bill.[123] The Corporation will offer loan and price guarantees to encourage private industry to develop synfuels. Until the corporation is set up the President is authorized to use up to $3 billion to aid industry.[124] The Corporation will be able to enter into joint ventures with private industry as well as help finance related mining and transportation support developments. It is clear that the federal government will shortly be much more financially active in synfuel development. This financial involvement appears to be far more rational than the head-first plunge proposed by the Administration.

Once having obtained assistance from the Synthetic Fuel Corporation, an organization contemplating construction of an HBSG plant must prepare to deal with other legal issues and concerns. The following section will detail the more significant concerns facing an energy company proposing construction of an HBSG plant.

117. H.R. 4985, 96th Cong., 1st Sess. (1979).
118. 37 CONG. Q. WEEKLY 2447 (Nov. 3, 1979).
119. *Id.*
120. N.Y. Times, June 28, 1980, at 1, col. 6.
121. H.R. 3930, 96th Cong., 1st Sess. (1979).
122. S. 932, 96th Cong., 1st Sess. (1979).
123. 38 CONG. Q. WEEKLY 677 (March 8, 1980).
124. 38 CONG. Q. WEEKLY 833 (March 22, 1980).

B. *NEPA*

The responsibilities associated with the National Environmental Policy Act (NEPA),[125] while burdensome, may actually prove to be helpful in relation to dilemmas under other statutory schemes. NEPA is generally intended to be a tool for environmental full disclosure and environmentally well reasoned decisionmaking by federal agencies.[126] Federal agencies are to integrate environmental concerns into the decisionmaking process itself.[127] However, nothing in NEPA requires that the responsible federal agency must necessarily make an environmentally sound decision or even give environmental factors determinative weight.[128] The purposes of NEPA and responsibility for carrying out the purposes pertain to federal agencies. The bulk of this article has dealt with private development of HBSG plants. Why then is NEPA even a factor?

The so called action-forcing portion of NEPA is Section 102(2)(c).[129] Essentially it requires federal agencies to prepare detailed Environmental Impact Statements (EIS) for "every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the human environment." For purposes of discussion here, the relevant concern is whether a given project is a major federal action significantly affecting the human environment. Federal courts in the last ten years have consistently held that situations can exist where the working relationship between a private entity and a federal agency is such as to make a project a "federal action."[130] It is equally clear where an agency grants a permit or issues an authorization necessary for a project by a private entity, such action may be deemed a federal action.[131] The Council on Environment Quality (CEQ) has recently promulgated regulations governing the EIS process which also define "federal action" in this manner.[132] The question then arises as to whether the construction by a private energy corporation of an HBSG plant will constitute a major federal action significantly affecting the human environment.

As should be obvious from discussion above the average HBSG plant will have a significant impact on the environment. The determination of whether such a project is a federal action is less obvious. If substantial financial assistance from the federal government makes the project possible, then NEPA will be triggered.[133] Here, involvement of the Synthetic Fuels Corporation or DOE will be most likely a factor. One of these agencies, not the private developer, will be responsible for preparation of the EIS. However, the corporate officials had better be prepared to cooperate with the

125. 42 U.S.C. § 4321 (1976).
126. Strycker's Bay Neighborhood Council, Inc. v. Karlen, 100 S. Ct. 497 (1980).
127. Andrus v. Sierra Club, 99 S. Ct. 2335 (1979).
128. 100 S. Ct. at 500.
129. 42 U.S.C. § 4332(2)(c)(1976).
130. Scottsdale Mall v. State of Indiana, 549 F.2d 484 (7th Cir.), *cert. denied*, 434 U.S. 1008 (1977); Silva v. Romney, 473 F.2d 287 (1st Cir. 1973).
131. *See, e.g.*, Minnesota Pub. Int. Res. Group v. Butz, 498 F.2d 1314 (8th Cir. 1974); Wyoming Outdoor Coordinating Council v. Butz, 484 F.2d 1244 (10th Cir. 1973).
132. 40 C.F.R. § 1508.18 (1979).
133. Ely v. Velde, 451 F.2d 1130 (4th Cir. 1971); 40 C.F.R. § 1508.18 (1979).

federal agency during the EIS preparation. The corporation will likely have, at its disposal, much of the information needed to make the EIS thorough and legally adequate. Indeed, the corporation may have to do the bulk of the preparation of the EIS.

If the developer chooses to forego federal financial assistance, NEPA considerations may still be a factor. The developer will have certain responsibilities pursuant to the Clean Air Act. Preconstruction review under either nonattainment or prevention of significant deterioration (PSD) provisions of a relevant state implementation plan will be necessary.[134] However, neither these requirements nor any similar requirements resulting from provisions of the New Source Performance Standards (NSPS) will trigger NEPA. Congress has determined that any actions by the U. S. EPA under the Clean Air Act are exempt from NEPA requirements.[135] EPA actions pursuant to the Clean Water Act are likewise generally exempt from NEPA.[136] Therefore even though a developer may be required to obtain a permit to discharge pollutants into navigable waters, NEPA will not necessarily be triggered. The only relevant exception to that policy is with regard to new sources. (Of course, an HBSG plant would be a new source.) As discussed below, the Clean Water Act sets up a permit program for polluters.[137] This program is envisioned to be run by the individual states following delegation by EPA. If the particular state where a plant is to be built has control of the permit program, then no EIS will be necessary. On the other hand, if EPA is still administering the program, then it will be required to comply with NEPA prior to issuance of a permit. Finally, hazardous wastes generated by a HBSG plant may well require issuance of an EIS. Recently promulgated regulations for the Resource Conservation and Recovery Act (RCRA)[138] set up elaborate permit requirements for "cradle to grave" handling of hazardous wastes.[139] Issuance of permits to an HBSG plant, particularly for any on-site disposal of wastes, should clearly be deemed a major federal action.

As should be clear, it is quite likely that an EIS will be necessary for an HBSG plant. The developer should include preparation time in any timetable for construction. While the CEQ regulations are intended to streamline this process, it still will require several months for preparation. The EIS should be prepared and ready for issuance at the time the federal action, whatever it may be, is proposed.[140] The CEQ regulations require that the responsible federal agency contemplate an early and open process for determining the scope of issues to be addressed in the EIS.[141] This process, largely untried at this writing, should aid interested parties in clarifying en-

134. See discussion of issues and procedures arising under requirements of the Clean Air Act in text accompanying notes 143-82 *infra*.
135. 15 U.S.C. § 793(c)(1)(Supp. II 1978)(amending 15 U.S.C. § 783(c)(1)(1976)).
136. 33 U.S.C. § 1371(c)(1)(1976).
137. 33 U.S.C. § § 1311, 1342 (1976 and Supp. II 1978).
138. 42 U.S.C. § 6901 (1976 and Supp. II 1978).
139. 45 Fed. Reg. 12,722 (1980)(to be codified in 40 C.F.R. § 260).
140. Kleppe v. Sierra Club, 427 U.S. 390 (1976); 40 C.F.R. § 1502.5 (1979).
141. 40 C.F.R. § 1501.7 (1979).

vironmental issues and hurdles facing an HBSG plant.[142] This should be an excellent document to clarify for the developer all of the possible roadblocks or obstacles to be faced during construction. It should also serve to open the eyes of the developer to environmentally protective action needed. This will also be an early opportunity for the public to have input into the HBSG plant planning process.

C. *The Clean Air Act*

As noted above, an HBSG plant will not present the same magnitude of air pollution problems as those posed by a coal-fired electric power plant. Nonetheless, pollution will be significant enough to trigger various regulatory aspects of the Clean Air Act. The Act itself is structured in such a way as to encourage maximum state control and administration of the requirements. Much of this control is delegated to the state only after careful inspection of ability and authority by EPA. The key to state programs is the State Implementation Plan (SIP) required by Section 110 of the Act.[143] The plan must set out schedules, emission limitations, assurances of adequate funding and personnel, a plan for prevention of significant deterioration, a plan for dealing with pollution in so called nonattainment areas, ability to inspect and monitor sources, and, in some instances, vehicle inspection and maintenance plans.[144] In theory, negotiations for permits, preconstruction review, and emission limits will be conducted with state government. However, circumstances presently are such in most states that the key aspects of the Act are being federally administered.

In 1977, Congress passed significant amendments to the Act which clarified and codified state responsibilities for PSD and established new responsibilities for dealing with areas failing to attain the National Ambient Air Quality Standards. Less than speedy promulgation of regulations and litigation have left EPA in control of these areas in most every state. Therefore any developer planning an HBSG plant will probably be negotiating with EPA. Depending upon the location of a proposed facility, these negotiations will either be pursuant to Part C of the Act (PSD) or Part D of the Act (Nonattainment).

The concept underlying PSD is that areas of the country which presently have clean air should remain that way. Development is not totally forbidden in these areas however. Initially the clean air areas are inventoried or designated pursuant to Section 107.[145] All of these areas are then classified either Class I, Class II, or Class III.[146] Most of the areas will be Class II. (It should be noted also that many of the areas in the West, which may well be sites for HBSG plants, are PSD areas. Areas in the East likely to be chosen for plants are more likely to be nonattainment areas). Within

142. Goplerud, *NEPA at Nine: Alive and Well, or Wounded in Action*, 55 N.D. L. Rev. 497 (1979).
143. 42 U.S.C. § 7410 (Supp. II 1978).
144. *Id.*
145. 42 U.S.C. § 7407 (Supp. II 1978).
146. 42 U.S.C. § 7472 (Supp. II 1978).

these areas varying increases in amounts of key pollutants, at this point sulfur dioxide and particulates, will be allowed. Class I areas allow the least increase, thus the least development; Class III allows the most increases, thus the most development.[147] Other pollutants emitted by HBSG plants are also subject to controls. The "increments" will be tabulated from a baseline point which is determined as of the time of application for the first permit in an area.[148] In order to fully understand this program, it is perhaps initially important to see what type of project triggers PSD factors and requirements.

Only major sources of pollution are subject to the intricate preconstructive review and permitting requirements. Section 169(1) defines major source as any one of numerous listed types of facilities which emit, or have the potential to emit, 100 tons per year of any pollutant.[149] The section also includes any other source, not set out in the list, which has the potential to emit over 250 tons per year of any pollutant. There has been dispute between EPA and industries as to whether the section should be read as relating to controlled or uncontrolled emissions. This dispute has been resolved in favor of a definition which relates to controlled emissions.[150] Among the listed sources under Section 169(1) are fuel conversion plants. As noted above, the emissions for an HBSG plant will be more than 100 tons per year.[151]

What must an HBSG plant developer do in order to obtain a permit for construction and how much of a delay factor will this work into a project? Section 165 of the Act sets out the general requirements for preconstruction review and permit processing.[152] The Statute expressly requires emission limitations for *any* pollutant emitted to be based upon a case-by-case determination of best available control technology (BACT).[153] It should be underscored that this applies not simply to SO_2 and particulates, but for "each pollutant subject to regulation" under the Act.[154] The developer must also conduct an air quality analysis for the area impacted by the project.[155] The developer must also carry out such monitoring as may be necessary to determine the effect of the project's emissions on the area.[156] A public hearing must be held prior to issuance of a permit. Added protections and consultation requirements are imposed for sources which will impact on federal pub-

147. 42 U.S.C. § 7473 (Supp. II 1978).

148. 42 U.S.C. § 7479(4)(Supp. II 1978). The increments are the amount of SO_2 and/or particulates which may be added to existing air quality levels.

149. 42 U.S.C. § 7479(1)(Supp. II 1978).

150. Alabama Power Company v. Costle, 606 F.2d 1068 (D.C. Cir. 1979). This case involved challenges to regulations promulgated by EPA dealing with prevention of significant deterioration concepts. The case is a primary starting point for consideration of PSD issues. Equally important are new proposed regulations responsive to this decision. (40 C.F.R. § § 51-52 (1979)).

151. *See* note 92 *supra*.

152. 42 U.S.C. § 7475 (Supp. II 1978).

153. 42 U.S.C. § 7475(a)(4)(Supp. II 1978).

154. *Id.*

155. 42 U.S.C. § 7475(a)(6)(Supp. II 1978).

156. 42 U.S.C. § 7475(a)(7)(Supp. II 1978).

lic lands.[157] Western HBSG plant developers should pay particular attention to these requirements.

The administrator of EPA promulgated regulations implementing and clarifying portions of the 1977 Amendments regarding PSD on June 19, 1978.[158] These regulations were quite controversial and naturally were challenged by both industry and environmental groups. The District of Columbia Circuit Court of Appeals decided initial issues pertaining to the effective date of preconstruction review and permit requirements in March of 1979.[159] The more substantive issues were decided by the court in the case of *Alabama Power Company v. Costle*, handed down in per curiam form in June of 1979[160] and followed by a detailed opinion in December of the same year.[161] Some of the regulations were approved and numerous significant regulations were disapproved and remanded for reconsideration by the administrator. Many of the issues decided have little bearing on the application for construction of an HBSG plant. Several do, however, and will be briefly summarized.[162]

Probably the most crucial consideration for a developer is the need to put together plans for a project and begin the review process as soon as possible. Waiting too long may prove fatal. The allowed increments in a given PSD area may already have been used by other projects. This is already happening in some areas.[163] Some mitigation of this need for speed is provided in the *Alabama Power* Court's analysis of the issues surrounding calculation of the baseline. It is this baseline from which the increments are calculated. EPA had defined baseline concentration in terms of actual air quality as of August 7, 1977, the date of the signing by President Carter of the 1977 Amendments to the Act.[164] This definition was clearly contrary to the express language of the Act which defined baseline as the air quality at the time of the first application for permit in a given PSD area.[165] The court had little difficulty in holding the administrator had no authority to set the uniform baseline.[166]

Another issue which faced the *Alabama Power* court was whether a source should be subject to PSD regulations only if it is located in a PSD area or, in addition, if it will impact on one. EPA's regulations imposed

157. 42 U.S.C. § 7475(d)(Supp. II 1978).

158. 43 Fed. Reg. 26,380; 26,388(1978).

159. Citizens to Save Spencer County v. EPA, 600 F.2d 844 (D.C. Cir. 1979).

160. [1979] 13 ENVIR. REP. CAS. (BNA) 1225 (D.C. Cir).

161. 606 F.2d 1068 (D.C. Cir. 1979).

162. The court dealt with the issues in a fashion which also included consideration of nonattainment issues. The agency has now proposed new regulations to replace the invalidated ones (*see* note 149 *supra*) and has also stayed the effect of the old regulations (45 Fed. Reg. 7800 (1980)). The issues dealt with by the court included: the definition of potential to emit, exemption of small sources, protection of the increments, application of PSD permits to sources in nonattainment areas, fugitive dust sources, the baseline date for increment calculations, modeling, stack heights, bubble policies, pollutants subject to the various regulations and determination of dates for commencement of construction.

163. [1979] (Current Development) ENVIR. REP. (BNA) 1640-41.

164. 40 C.F.R. § 51.24(b)(11)(1979).

165. 42 U.S.C. § 7479(4)(Supp. II 1978).

166. 606 F.2d at 1089.

preconstruction review upon all sources, wherever they might be located, if their emissions would have an impact on any clean air area.[167] The court found that the language of Section 165, which utilizes the phrase "constructed in any *area* to which this part applies," limits the application of the PSD requirements to facilities locating in clean air areas rather than to those facilities which may impact on clean air areas.[168] The court added that this holding applied to those situations involving interstate pollution. That is, Section 165 preconstruction review and permit requirements will not apply to major sources which are to be sited in nonattainment areas of one state and will adversely impact a clean air area in a neighboring state.[169] As noted below in the discussion of nonattainment area requirements, a major source located in an area near a PSD area will not be free from any controls or reviews. Such sources will, however, escape the rigors of Section 165 preconstruction review.

If, on the other hand, the developers of an HBSG plant decide to locate the facility in a dirty air or nonattainment area, a different set of ground rules will apply. Areas are, of course, designated nonattainment for each of the various pollutants pursuant to Section 107. The developers should immediately determine the pollutants for which the area is nonattainment If the plant will cause or contribute to concentrations of these pollutants, then a number of issues arise. The initial matter for consideration is whether the area presently has a ban on construction of major sources. After July 1, 1979, there can be no construction of major sources of pollution in nonattainment areas unless the state in which the area is located has submitted and had approved a plan for attaining the ambient air quality standards by December 31, 1982.[170] Because of delays by states in submitting plans and subsequent delays by EPA in reviewing them, the construction ban applies in most nonattainment areas. Presumably this will have changed by the time intense HBSG development begins.

Once a plan is in place it will require that a major source, such as an HBSG plant, obtain a permit prior to commencement of construction.[171] No permit can be issued unless it is part of a program to assure a net reduction of total emissions in the area. The Act requires reasonable progress toward attainment and new construction is allowed only within that framework.[172] The states have two choices in allowing for industrial growth. They can require existing sources to clean up only to a level of attainment.[173] Individual states may, on the other hand, want to build in a growth margin and require existing sources to clean up beyond attainment levels, thus allowing new sources an opportunity to add to existing pollutants without creating violations of air quality standards.[174]

167. 40 C.F.R. 51.24(i)(1)(1979).
168. 606 F.2d at 1082 (emphasis added).
169. *Id.* at 1084.
170. 42 U.S.C. §§ 7410 and 7502(a)(Supp. II 1978).
171. 42 U.S.C. § 7502(b)(6)(Supp. II 1978).
172. 42 U.S.C. § 7502(b)(3)(Supp. II 1978).
173. 42 U.S.C. § 7503(1)(A)(Supp. II 1978).
174. 42 U.S.C. § 7503(1)(B)(Supp. II 1978).

It is likely that many states will choose the former, thus utilizing the emissions offset system already in place.[175] This system essentially allows emissions from the new source to be offset by reductions in emissions from existing sources. For example, an HBSG developer seeking to offset SO_2 emissions would seek out an existing source of SO_2 emissions and put together a plan to reduce those emissions. The HBSG developer would provide the capital for such reductions. They must be reductions not required under the SIP and they must be more than the emissions produced by the HBSG plant.[176] This may even involve obtaining reductions at more than one location. If the project is vital to the area, it should not be altogether unreasonable to anticipate government assistance in obtaining the offsets.[177] It is important to note that the offsets must be of like pollutants. That is, SO_2 must be traded for SO_2 or particulates must be traded for particulates.[178] The offsets, in order to be valid, must be legally binding, i.e., part of the SIP.[179]

In order to obtain a permit to construct and operate an HBSG plant in a nonattainment area, a developer will need more than offsets. The plant must comply with the lowest achievable emission rate (LAER).[180] The developer must show that all other sources owned or operated by it in the particular *state* are either in compliance, or on a schedule for compliance, with the applicable SIP.[181] Finally, it must be shown that the SIP is being "carried out" for the nonattainment area where the source is to be located.[182]

HBSG plants will be far less harmful to air quality than coal fired electric generating plants. HBSG plants will undoubtedly be allowable in some PSD areas and some nonattainment areas. The developer should be aware of the permit requirements under both parts of the Act. The developer should realize that while EPA hopes to makes these procedures efficient and speedy, they will be time consuming. It may be that the Energy Mobilization Board will aid the process, but absent this help, many months' work and waiting may be anticipated. A final caveat is in order. The developer should be aware of the possibility that in a given area the HBSG plant proposal may be subject to both PSD and nonattainment requirements. Areas are, after all, designated under Section 107 for each pollutant.

D. *The Clean Water Act*

The typical HBSG plant will have a significant impact on the water quality of the particular area in which it will locate. Assuming that the

175. 41 Fed. Reg. 55,524 (1976), *revised at* 44 Fed. Reg. 3274 (1979).

176. 44 Fed. Reg. 3284 (1979).

177. Quarrles, *Federal Regulations of New Industrial Plants*, 10 ENVIR. REP. (BNA) 18 (Monograph No. 28, May 4, 1979).

178. The EPA Emission Offset Interpretive Ruling of Jan. 16, 1979, holds that only intrapollutant emission offsets will be acceptable (*i.e.*, hydrocarbon increases may not be offset against SO_2 reductions). 40 C.F.R. § 51, App. S, at 143 (1979).

179. 42 U.S.C. § 7503 (Supp. II 1978).

180. 42 U.S.C. § 7503(z)(Supp. II 1978).

181. 42 U.S.C. § 7503(3)(Supp. II 1978).

182. 42 U.S.C. § 7503(4)(Supp. II 1978).

developers do not opt for a zero discharge unit, the plant will discharge significant quantities of pollutants. These discharges will subject the facility to the provisions of the Clean Water Act.[183] The basic premise of the Clean Water Act is that the navigable waters of this control continue to be significantly polluted, and industrial and municipal sources discharging into streams and lakes are the villains in this whole scheme. Congress therefore devised a framework within which sources of pollutants may discharge into navigable waters only after having obtained a permit to do so.[184] This program, the National Pollutant Discharge Elimination System (NPDES),[185] ideally will lead to a situation where, by 1985, there are no discharges of pollutants in the United States.[186]

The permit system established under Section 402 of the Act is the key to state and federal cooperative efforts in controlling water pollution. Just as it had under the Clean Air Act, Congress determined that primary responsibility for the administration and enforcement of the Act should be with the states. Thus, under the Act, the authority for operation of the permit program may be delegated to the states. As of this writing, thirty-three jurisdictions have assumed responsibility for the program. Therefore, it is highly likely that the developer of an HBSG plant will be dealing with state officials regarding a permit. The system has procedural and substantive import for a synfuel plant.

The procedures for obtaining a permit have recently been extensively revised by EPA.[187] These procedures are generally applicable regardless of whether the particular state or EPA is running the program. Several points should be noted with regard to the procedural regulations. First, they are presently the subject of litigation.[188] Second, EPA has proposed regulations which would establish a consolidated permit program covering permits necessary pursuant to the Clean Water Act, the Resource Conservation and Recovery Act, the Safe Drinking Water Act, and the Clean Air Act.[189] These regulations could have a positive impact on industry generally. Third, the developer should be aware that it is necessary that an application for a permit be filed at least 180 days prior to commencement of discharge by the source.[190] This is an important consideration in terms of planning a construction timetable. The developer should be thoroughly familiar with the specific procedures necessary for application and securing of the permit. Finally, even if the state is administering the permit program, EPA retains a veto authority over issuance of individual permits.[191]

183. 33 U.S.C. § 1251 (1976).

184. 33 U.S.C. §§ 1311, 1342 (1976). "Navigable waters" is defined broadly under the Act such that it is difficult to imagine any water utilized by an industrial discharger which would not be covered by the Act.

185. 33 U.S.C. § 1342 (1976).

186. 33 U.S.C. § 1251 (1976).

187. 40 C.F.R. §§ 122, 123, 124 (1978).

188. Virginia Elec. and Power Co. v. EPA, 610 F.2d 187 (4th Cir. 1979). Only a small procedural issue has been decided. The remaining substantive issues are pending before several circuit courts awaiting consolidation and assignment to one court.

189. 44 Fed. Reg. 34,244 (1979).

190. 40 C.F.R. § 122.10(c)(1978).

191. 33 U.S.C. § 1342(d)(1976).

The substantive requirements for an HBSG plant will be contained in the permit. The Act establishes technology standards and receiving water quality standards which must be adhered to by a discharger. The technology standards established pursuant to Sections 301 and 304 of the Act[192] govern, unless there is going to be an interference with attainment of water quality sufficient to support wildlife, recreation, public health, and agriculture.[193] If this is the case then more stringent requirements become part of the permit. The technology standards are dealt with at several different levels by EPA.

The Clean Water Act, in a manner similar to that found in the Clean Air Act, establishes more stringent controls for new sources. These new source performance standards must yield a level of effluent limitation or operating requirements achievable through the use of best available control technology.[194] A synfuel plant such as is the focus of this article would, of course, be a new source. But, will it be for purposes of the Clean Water Act? At this point it would not be. EPA has not promulgated or proposed new source performance standards for coal gasification plants. A source will be subject to NSPS only if the agency has issued or proposed standards prior to commencement of construction.[195] This does not leave the HBSG plant between the cracks of the Act. It will be treated as if it were an existing facility.

As amended in 1977, the Act requires discharge of conventional pollutants to be subject to best conventional pollutant control technology (BCT) by July 1, 1984.[196] Discharge of toxic pollutants must be controlled by best available technology (BAT) no later than July 1, 1984.[197] Finally, nonconventional pollutants will be subject to BAT by July 1, 1984, or within three years after an effluent limitation has been established. In no event may compliance be later than July 1, 1987.[198] HBSG plants would discharge effluents subject to all three categories. These control technologies are to be established on an industry-by-industry basis. In other words, EPA is required to issue effluent limitation guidelines for specific categories of industrial sources.[199] These guidelines are to aid the permit issuer in establishing source specific effluent limitations and compliance schedules. Such limits become the key elements of the NPDES permit.[200] As in the case of the new source performance standards, EPA has yet to issue effluent guidelines for coal gasification units. The developer will thus be subject to an individualized determination of limitations and compliance schedules necessary to achieve the goals of the Act.[201] A final note is in order with regard to the

192. 33 U.S.C. §§ 1311, 1314 (1976).
193. 33 U.S.C. § 1312(a)(1976).
194. 33 U.S.C. § 1316 (1976).
195. *Id.*
196. 33 U.S.C. § 1311(b)(z)(E)(1976). Conventional pollutants include biochemical oxygen demand (BOD), total suspended solids (TSS), pH, fecal coliform, and oil and grease. (40 C.F.R. § 401.16)(1978)).
197. 33 U.S.C. § 1311(b)(2)(1976). The EPA has established an initial list of toxic pollutants which can be found at 40 C.F.R. § 401.15 (1978).
198. 33 U.S.C. § 1311(b)(2)(F)(1976).
199. 33 U.S.C. §§ 1311, 1314 (1976).
200. 33 U.S.C. § 1342(a)(1976).
201. The Administrator is given authority in § 402(a)(1) to act on a case-by-case basis where

Clean Water Act. If a developer determines it is more economically sound to avoid direct discharge into a river or stream, consideration of discharging into a publicly owned treatment works (POTW) is advisable. This allows the source to avoid the rigors of obtaining a permit. In this case it would be the POTW which would be discharging into the navigable waters. The HBSG plant would, however, be required to meet certain standards for pretreatment of effluents.[202]

It is clear that an HBSG plant which does not utilize a closed system for water usage will come within the parameters of Clean Water Act. It may be that a particular developer will decide that in the interests of maintaining water quality and reducing administrative and monetary costs, a closed system is advantageous. It appears likely that western plants will use a zero discharge approach.[203] As shown below, this approach does not free the facility from the regulatory realm.

E. *Resource Conservation and Recovery Act*

The Resource Conservation and Recovery Act of 1976 (RCRA)[204] is yet another piece of environmental legislation of which the HBSG facility developer must be aware. The plant will generate wastes, likely to be termed hazardous by EPA, as by-products of its air pollution control equipment. These will include scrubber sludge and ash. In addition, if the developer determines it to be cost effective to construct a closed system for water handling there will be hazardous wastes which must be removed from lagoons or holding ponds on the premises. The generation, storage and/or removal of these wastes may well subject the plant to the terms of RCRA and regulations promulgated thereunder.

There is an inherent difficulty in analyzing the applicability of RCRA to a particular facility. The Act was passed in 1976. Congress mandated that regulations be promulgated within eighteen months of enactment, April 21, 1978, to implement the requirements of listing substances and controlling their disposal, storage, or transport.[205] The regulations were not even *proposed* by EPA until December 18, 1978.[206] This came about only after litigation was initiated by the state of Illinois and various environmental groups to challenge EPA's failure to meet the statutory timetable.[207] A portion of the regulations was issued in final form on February 26, 1980.[208] To add to the confusion, the regulations which remain to be promulgated will be ones providing definitions of "hazardous waste" and "hazardous waste generator." They will also detail testing methods for determining if a particular

no guidelines have been established. This section states a facility may be subjected to "such conditions as the Administrator determines are necessary to carry out the provisions of this Act." 33 U.S.C. § 1342(a)(1)(1976).

202. 33 U.S.C. § 1317(b)(1976).

203. Remarks of David Abbey at Energy and the Public Lands IV Conference, Salt Lake City, Utah (Apr. 18, 1980).

204. 42 U.S.C. § 6901 (1976).

205. 42 U.S.C. § 6921 (1976).

206. 43 Fed. Reg. 58,956 (1978).

207. Illinois v. Costle, [1979] 12 ENVIR. REP. CAS. (BNA) 1597 (D.D.C.).

208. 45 Fed. Reg. 12,722 (1980) (to be codified in 40 C.F.R. § 260).

waste is hazardous, as well as providing a list of specific hazardous wastes. These regulations were issued on May 19, 1980.[209] The final act for this theatre of the uncertain will undoubtedly be litigation challenging the validity of the regulations.

Despite the confusion and uncertainty, the developer of an HBSG should be aware of the general scheme of the Act and be able to anticipate its application to specific situations. The Act speaks to both hazardous and nonhazardous solid wastes. The most stringent requirements for the HBSG developer are going to involve hazardous wastes. The developer should, of course, be cognizant of any state or local legislation which might affect its generation of nonhazardous wastes. It should be noted that while the term "solid waste" is utilized in the Act, the definition of this term is much broader than one might normally think.[210] With regard to regulation of hazardous wastes, the Act establishes a "cradle to grave" control program. In other words, the Act requires notice, monitoring, and substantive regulations which originate with the generator of the waste and continue through to the storage of the waste.

The initial step for an HBSG facility in this whole process will be to determine whether indeed it is generating hazardous wastes. At the very least the wastes generated by the air pollution control equipment will be included under the definition of solid waste.[211] The wastes from a closed water usage system may also fit within the Act. The next question will be whether these are hazardous wastes. The wastes generated by the HBSG facility will be considered hazardous if they are on the EPA's list of particular hazardous wastes.[212] If they are not on the list then the generator must evaluate them according to the Act's criteria for determining what wastes are hazardous. These include ignitability, corrosiveness, reactivity, and toxicity.[213] Assuming for the moment that the wastes are determined to be hazardous, a number of procedural and notice requirements are then imposed upon the facility's operator.

The cradle to grave concept is implemented through an elaborate record keeping and manifest system. It begins with notifying EPA of the generation of hazardous wastes.[214] The facility must obtain an EPA identification number.[215] Prior to having the wastes removed from the plant site, the generator must prepare a manifest containing information about the wastes, the generator, transporter, and the receiving facility.[216] The wastes must be

209. 45 Fed. Reg. 33,066-33,285 (1980) (to be codified in 40 C.F.R. §§ 261-265).

210. 42 U.S.C. § 6903(27)(1976).

211. *Id.*

212. 42 U.S.C. § 6921(a)(1976). These wastes are included in the portion of the final regulations not yet promulgated.

213. *Id.*; 43 Fed. Reg. 58,954-58,955, 58,957 (1978). The particular methods for testing for these characteristics are also part of the proposed regulations.

214. 42 U.S.C. § 6930(a)(1976).

215. 45 Fed. Reg. 12,733 (1980) (to be codified in 40 C.F.R. § 262.12).

216. See 40 C.F.R. §§ 262.20, 262.21. The names, addresses, and EPA identification numbers of the generator, transporter, and receiving facility must be included. The manifest must also contain a description of the wastes, both quality and quantity. These descriptions and other aspects of the manifest must be coordinated with U.S. Dep't of Transp. Reg. 49 C.F.R. Part 172.

packaged, labeled, and marked according to U. S. Department of Transportation regulations for hazardous materials.[217] Before turning the wastes over to the transporter, the generator must certify by signing the manifest that all transportation requirements have been met.[218] If delivery cannot be made to the designated facility or a designated alternate, the transporter may well have to return the wastes to the generator. Finally, it is clear that an HBSG operator could have wastes transported *only* by an EPA registered hauler and transported *only* to an EPA registered storage and treatment facility.[219] Ultimate liability for any deviations falls to the generator of the material.[220] It therefore will behoove the HBSG developer to carefully monitor the haulers and waste disposal site owners it chooses.

The HBSG plant operator has one other alternative with regard to hazardous wastes which it may generate. It may choose to treat and store these wastes on site. If it does so, it becomes in effect a hazardous waste management facility. It would be subject then to the substantive standards EPA will promulgate for facilities which treat, store, or dispose of wastes.

As noted above, confusion has been the rule with RCRA. It is likely to continue for some time. As with the Clean Air Act and Clean Water Act, RCRA provides the opportunity for states to take over the administration and enforcement of hazardous waste control.[221] It should also be noted that RCRA provisions are included as part of EPA's proposed consolidated permit program.[222] Finally, the Love Canal and Valley of the Drums discoveries have caused a significant government and public uproar over hazardous wastes. It is therefore likely that enforcement of RCRA provisions will be vigorous. Indeed, it is one portion of EPA's domain which will get a big budgetary shot in the arm in 1980.[223]

F. *Water Rights Issues*

Water is a vital element in the operation of an HBSG plant. Water availability thus is crucial to the planning and development of such a facility. The amount of water available for an HBSG plant and the ease of obtaining it will depend upon where the plant will be located. Water availability should not pose a significant problem in the eastern part of the country. Water will, however, be quite difficult to obtain in the West, even for those plant utilizing a zero discharge approach.

Most any area in the East which might support an HBSG plant will have a sufficient quantity of water from which to draw. The significant issue, therefore, will be the relative ease of obtaining it in a legal sense. Obviously, in order to be absolutely certain of rights to water for energy development, the developer must consult the specific laws of the particular jurisdiction involved. Generally speaking, eastern states have based the right

217. 45 Fed. Reg. 17,733 (1980) (to be codified in 40 C.F.R. §§ 262.30, 32).
218. *Id.* (to be codified in 40 C.F.R. § 262.21(b)).
219. *Id.* (to be codified in 40 C.F.R. § 262.12(c)).
220. *Id.* (to be codified in 40 C.F.R. § 262.10(e)).
221. 42 U.S.C. § 6941 (1976).
222. 44 Fed. Reg. 34,244 (1979).
223. [1980] 10 ENVIR. REP. (BNA) 1920 (increase of $5.5 million and 155 personnel).

to use water on the concept of riparian rights.[224] Riparian rights are based upon traditional property concepts. That is, the owner of the property, in this case, water, may use it as he or she sees fit, so long as there is no resulting injury to other property owners. This property right gives to a landowner whose property touches a stream the right to make reasonable use of the water.[225] This is a right to use the water, not actual ownership.[226] Generally, the use must be on the so called riparian land, although the developer should analyze the laws of the particular jurisdiction involved. Some have become more liberal in their views of where the water may properly be used. The key to riparian rights is that the user must not do anything to infringe on the downstream riparian owner's right to also make reasonable use of the water. Similarly, the user would have an action against any upstream user who impaired his supply of water.[227] It should be noted that no quantified right is involved, as with western water law. Any amount of water may be used so long as no downstream owner is injured.

As with other issues, water availability will be particularly troublesome for anyone planning an HBSG plant for the western part of the country. Most of the jurisdictions in the West, including those with the most coal reserves, have adopted the law of prior appropriation for determination of water rights.[228] Prior appropriation is based upon a "first in time" concept. The first person or entity to take water from a stream or watercourse and put it to a beneficial use has the right to continue to do so. This right generally will be superior to subsequent appropriatiors along the same stream. In many of the jurisdictions which are governed by prior appropriation, the administration of the system is governed by constitutional or statutory provisions.[229] The crucial policy consideration in the western states is that the water belongs to the public and not the owner of the land through which the water passes.[230] Thus, the availability of the water is in no way connected to ownership of land. Generally speaking, the rights, once established, are held until abandoned.[231] The rights to already appropriated water may be transferred from one party to another in some instances.[232] Usually, such a transfer will be in the form of a sale. The HBSG developer should be aware of the procedures required for transfer in any given jurisdiction.[233] Part and parcel of this process would, of course, be a determination as to whether the new use would be a "beneficial" use. This term is generally defined by stat-

224. F. TRELEASE, CASES AND MATERIALS ON WATER LAW 10 (2d ed. 1974).

225. *Id.*

226. J. MACDONALD & J. BEUSCHER, WATER RIGHTS 79 (2d ed. 1973).

227. RESTATEMENT (SECOND) OF TORTS § 850 (1979).

228. F. TRELEASE, *supra* note 222.

229. *See, e.g.*, COLO. REV. STAT. § 37-92-102 (Supp. 1979); MONT. REV. CODES ANN. § 85-1-101 (1979); UTAH CODE ANN. § 73-3-8 (1978).

230. WYO. CONST. ART. VIII, § 1; COLO. REV. STAT. § 37-82-101; MONT. REV. CODES ANN. § 85-2-101; UTAH CODE ANN. § 73-1-5.

231. J. MACDONALD & J. BEUSCHER, *supra* note 224, at 92.

232. Holland, *Mixing Oil and Water: The Effect of Prevailing Water Law Doctrines on Oil Shale Development*, 52 DEN. L.J. 657 (1975); Trelease, *Changes and Transfers of Water Rights*, 13 ROCKY MTN. MIN. L. INST. 507 (1967).

233. *See* COLO. REV. STAT. § 37-92-302 (1973 & Supp. 1979); UTAH CODE ANN. § 73-3-3 (1978); WYO. STAT. § 41-3-104 (1977).

ute.[234] Most will include generation of power of industrial uses as beneficial.

The HBSG plant's place in the overall western water picture is a bit uncertain. Much of the water in the West is already committed. Most of it is committed to irrigated agriculture.[235] As the most recent entrant into the water sweepstakes, the energy industry, in this instance HBSG developers, must be prepared to purchase rights. Negotiations with farmers and ranchers may not be easy despite the existence of monetary resources on the part of the developer. The energy industry is intruding upon established lifestyles and is not necessarily universally welcome. The price is likely to be high.

State law will be the dominant focus of water rights questions in the West.[236] The developer must be aware, however, of rights accruing to the federal government and to native Americans. Whenever the government withdraws land from the public domain and reserves it for a federal purpose, such as a national park or forest, it also reserves, by implication, appurtenant unappropriated water. This water is in an amount necessary to fulfill the purpose of the reservation.[237] Essentially, the same right has been extended to Indian tribes. The Supreme Court has held that whenever the United States withdraws lands for the establishment of an Indian reservation, it impliedly withdraws unappropriated appurtenant water in an amount necessary for the purposes of the withdrawal.[238]

Water availability, both factually and legally, is a very significant issue for the HBSG developer desiring to locate in the West. The developer will not only have to determine who has how much for sale, but will be undoubtedly forced to negotiate delicately for it. The developer may also find himself in competition with other energy concerns for water. The difficulty in obtaining water may cause the developer to give second thought to eastern locations away from the plentiful western coal.

IV. CONCLUSION

Coal gasification specifically and synfuels generally are likely to be vital sources of energy in the next twenty to thirty years. Clearly, development is not going to occur overnight. Government financial assistance is going to be critical. Social and political acceptance, particularly in the West, will be crucial. The ability to recognize and deal with significant legal issues will also be invaluable.[239]

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234. MONT. REV. CODES ANN. § 85-2-102(2)(1979); WYO. STAT. § 41-3-102 (1977).

235. In the Four Corners Region, 80% to 90% is committed to agriculture. Ingram, Laney, & McCain, *Water Scarcity and the Politics of Plenty in the Four Corners States*, 32 W. POL. Q. 298 (1979).

236. This dominant role has been reinforced recently by the United States Supreme Court in United States v. New Mexico, 438 U.S. 696 (1978).

237. Cappaert v. United States, 426 U.S. 128 (1976).

238. Winters v. United States, 207 U.S. 564 (1908).

239. In addition to those dealt with in the body of the article, other issues may well arise. At the state level, many states now have Major Facilities Siting Acts. These are complex procedural and review-oriented laws designed to give state governments maximum control over location and design of power plants and major industrial facilities. Such laws are prevalent in both the East and the West. In addition, many states now have enacted legislation similar to NEPA. Such laws might require a developer to prepare an EIS even if the project had no federal in-

Development of low and medium BTU projects continues on a small scale. Most of the major companies seeking to build HBSG facilities are apparently waiting for a clear financial and legal road. Texaco, Southern California Edison, and several other concerns are well into planning for what will be the nation's first commercial sized plant. The facility, to be located near Daggett, California, is scheduled for operation in 1983.[240] Even with this plant, complete funding has yet to be obtained.

The HBSG developer will have to be patient and resourceful. Above all, in order to "sell" the product and the facility, the plants must be planned, built, and operated in a responsible manner. This includes environmental, economic, social, and political responsibility. If done in such a manner, synfuel can be a valuable near term energy source.

volvement. Local land use laws may have a significant impact; as may considerations for road, railroad, and pipeline rights-of-way.

At the federal level the Endangered Species Act, 16 U.S.C. § 1531 (1976), may prove to be a factor. For a project which is integrated with mining operations, the Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. § 1201 (1976), should be thoroughly analyzed. As noted, many of these legal obstacles may be smoothed over by the Energy Mobilization Board.

240. 105 PUB. UTIL. FORT. 66 (1980).