APPENDIX D SOCIO-ECONOMIC IMPACT OF SYNTHETIC FUELS COMMERCIALIZATION

A. NATURE OF SOCIAL COSTS

Projected labor requirements for synthetic fuels commercialization would necessitate population shifts and result in rapid rates of growth in those rural areas where mining and processing facilities are located. If recent experience with accelerating energy resources development is a guide, such rapid growth would be accompanied by certain adverse socio-economic impacts or "costs," at least in the short run. These include disruption of local labor markets, severe and chronic housing shortages, extraordinary inflation (particularly in the cost of public services), and abnormally high rates of alcoholism, accidents, employee absenteeism and turnover, divorce, delinquency, mental illness, child abuse, and suicide.1/ Significant redistribution of income will also result.

The benefits of such growth will accrue primarily to the nation (in terms of increased domestic energy production) and to a particular state or region (in terms of general economic development), while costs will accrue primarily at the local level.

In general, such adverse socio-economic impacts will be more severe:

- the smaller the original population base,
- the greater the incremental rate of growth,
- the lower the rate of local unemployment,
- the lower the excess carrying capacity of local infrastructure, and,
- the more geographically concentrated the energy resource developments.

Consequently, adverse impacts of synthetic fuels commercialization could be expected to be more severe in the Northern Great Plains, Rocky Mountains, and Four Corners regions than in the Appalacian and Eastern Interior regions. This is primarily because the former are sparsely populated, would undergo relatively higher rates of growth, have the least existing infrastructure, and would be subject to larger concentrations of energy development.

1/ This experience has been documented for certain Western energy boom towns by University of Denver Research Institute. The Alaskan pipeline has also resulted in these same problems, according to state planners.

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Many of the social costs of rapid growth can presumably be prevented or mitigated by investing in planning and public infrastructure precedent to the population influx, although some costs are unavoidable no matter how much money is committed. In theory, however, those costs which can not be either avoided or mitigated will be at least partially compensated for through higher salaries.

B. NATURE OF STATE AND LOCAL FINANCING PROBLEMS

Whether or not lead-time investment in public infrastructure will, in fact, reduce the social costs, rapid growth induced by synthetic fuels commercialization will present states and localities with significant financing and fiscal problems for the following reasons.

1. Revenue Lag

The collection of additional tax revenue from new industry and new residents will lag infrastructure expenditures by 2-5 years on the average, and current level revenues from existing residents and industries would not cover either full or amortized capital costs of infrastructure. Such fiscal lag should be relatively short-term for the most part, however, because synthetic fuels developments will be capital intensive and eventually will add significantly to local tax bases (see Tab A).

2. Statutory Constraints

Most states and localities have self-imposed statutory constraints on their capacity to respond to rapid growth with sound fiscal and growth management policies. These include:

- Constitutional prohibitions against state bonding.
- Lack of bonding authority for certain types of jurisdictions.
- Conservative public debt limits.
- Preferential tax treatment of new industries and mobile homes.
- Non-existent or low severance taxes.
- Lack of tax distribution mechanisms which enable revenues to be shared equitably in cases where the taxing jurisdiction and the impact jurisdiction are not the same.
- Non-existent or minimal land use planning and control mechanisms.

Many Indian tribes face constraints which result from special Federal/Indian relationships and a variety of laws and legal interpretations. Among these are the lack of authority to issue tax-exempt bonds, inability to mortgage trust property, and lack of access to other revenue and credit resources ordinarily available to municipalities or private interests.

3. Performance of the Tax-Exempt Bond Market

Synthetic fuels-related bond issues may be politically infeasible because of local "no growth" sentiments. Or, they may be unmarketable due to high risks, which are perceived to stem from uncertainties in the technology, the world price of oil, the availability and ownership of water, environmentalists' opposition, and federal policy. Or, they may be relatively high cost because of a locality's lack of bonding history or bond rating, the small dollar amount of a particular issue, the condition of the capital markets at time of issue, the localized and illiquid nature of the tax-exempt market, or the extreme risk aversion which characterizes purchases of tax-exempts.

4. Exposure to Risk After Bonding

States and localities which have been able to bond for capital costs still face two potential problems: project delay and project failure. A state or locality can minimize the problem of heavy debt service in the first few years by selling bonds which delay start of principal retirement and by capitalizing the early interest payments. However, should a court injunction delay a project—and its tax revenues—a locality might not be able to cover its debt service. If a project failed, a state or locality would face a 15-20 year bond liability with no tax base from which to pay it.

The question of who should ultimately bear these risks is an important equity issue. In theory, it should be the end-user of the energy produced. But, because of the political and institutional realities, this may be infeasible, so much of the risk will be borne by the states and localities. From their viewpoint, such risk exposure is clearly undesirable. More importantly to them, it wouldn't exist were it not for direct federal incentives to stimulate the synthetic fuels industry. To them, then, synthetic fuels commercialization is a federal tampering with the market that will cause them serious near-term spill-over effects which may not be "worth" the possible long run net benefits. Furthermore, the existence of the federal incentives is seen to justify federal aid in mitigating the adverse impacts and financing problems.

5. Special Problems of Development on Indian Reservations

For projects located on reservations, the traditional sources of funding for public infrastructure may be limited or non-existent, thus requiring significant industry participation in the provision of public infrastructure. Any attempt to develop a "new town" on a reservation, however, is likely to run into strong opposition for a variety of social, political and cultural reasons.

Should synthetic fuels projects be built on reservations, then, the most likely outcome would be the expansion of off-reservation communities to accommodate the population influx. This would result in an inequitable tax burden because these communities would not be able to tax the on-reservation synthetic fuels plant for its "fair share" of public costs.

C. COST OF ADDITIONAL PUBLIC INFRASTRUCTURE TO SUPPORT SYNTHETIC FUELS

The estimated costs of public infrastructure for the three production scenarios, by fuel type, are given in the following table (see Tab B for assumptions and calculations).

	0.35 MM b/d Crude Oil Equivalent Program	1 MM b/d Crude Oil Equivalent Program	1.7 MM b/d Crude Oil Equivalent Program
Shale Oil	$ 98 M	$ 294 M	$ 490 M
Synthetic Crude	--	117	117
High Btu	198	472	812
Low Btu	47	113	223
Total Without Any New Towns:	$343 M	$ 996 M	$1642 M
Additional Cost of Public Infrastructure for 3, 6, or 10 New Towns:	$ 54 M	$ 107 M	$ 139 M
Total	$397 M	$1103 M	$1781 M

D. PROGRAM IMPLEMENTATION CONSIDERATIONS

How fast a Synthetic Fuels Commercialization Program can be implemented will depend largely on state and local cooperation. Each synthetic fuels plant must survive the exercise of multiple veto authorities to acquire numerous permits and rulings for water usage, rights-of-way, zoning, siting, emissions, etc. States, localities, and Indian tribes have considerable discretion not only for the substance of these decisions, but for the speed with which the decisions are made and announced.

Significant state and local opposition exists, particularly in the West, to rapid development of energy resources. Much of the opposition stems from:

- Pervasive uncertainties about when, where, and how much development will occur.
- Fear that rapid and widespread resource development will occur simultaneously in many areas in the very near-term.
- Feelings that the Federal Government is urging headlong development without sufficient consideration of alternatives—especially conservation.
- Likely "boom town" fiscal problems and deteriorating quality of life.
- Possible large new demands for water in water-short areas.
- Potential environmental damage.
- Perceived lack of state and local influence on federal decisions which affect their fiscal and natural resources.

However, many state officials view energy development as a net gain over time and, therefore, don't oppose development which is environmentally sound, sensibly paced, and pays for itself.

Existing and proposed state laws as well as court action threaten to delay national energy objectives, possibly by years. Examples include:

- A Montana law which places a three-year moratorium on diversion of water from agricultural to industrial (energy) uses.

- A temporary injunction against coal mining in the Powder River region as a result of a Sierra Club suit.
- Two suits in Montana over Indian water rights.

E. MITIGATING MEASURES

If the adverse impacts of synthetic fuels commercialization are to be prevented or mitigated through lead-time investment in public infrastructure, it appears that resources other than traditional state and local taxes and bonding may have to be tapped.

These other resources include state surpluses, new state severence or production taxes, and industry financing new towns, directly providing infrastructure, prepaying taxes, or guaranteeing or purchasing state and local bond issues. In addition, some form of federal aid may be necessary for the following reasons:

- Synthetic fuels are an important component of national energy objectives, and implementation of a federal commercialization program may not be feasible without some federal aid for the impacted communities.
- The impacts of synthetic fuels development ("boom towns," social costs, etc.) will be the direct result of federal action, subsidizing industry through the commercialization program.
- Existing analyses show that inequitable fiscal burdens can result from synthetic fuels commercialization under certain circumstances and that the state and localities may not be able to solve the fiscal problems entirely on their own.

Specific options for federal aid include:

- Do nothing.
- Require industry to provide infrastructure or assume the extraordinary state and local risks.
- Extend direct federal loans or debt guaranties to impacted jurisdiction on a "last resort basis," either through existing programs or a new program specific to synthetic fuels commercialization.
- Provide federal grants to impacted jurisdictions.

The four options differ as to level of probable federal costs, ranging from $24M to $400M at the 350,000 barrel level and $143M to $1780M at the 1.7 M barrel level.

F. ANALYSIS OF OPTIONS

1. Do Nothing

A decision to rely on this option implicitly assumes that:

(a) States and localities can and will solve the problem with their own resources, and/or

(b) Industry resources will be used extensively.

However, there are limitations to each of these assumptions.

(a) State and local resources may not be sufficient or able to be mobilized.

Current surpluses, e.g., may be illusory because of accounting practices, legal earmarkings, or inflation/recession pressures. To the extent that there are available surpluses, however, they could be used--where legal--to purchase municipal bonds or make loans to localities.

Elimination of certain state and local statutory constraints may be structurally impossible or politically infeasible, although some states have made significant progress recently.

The most administratively efficient, equitable, and productive mechanism to raise revenues for impacts would appear to be severance or production taxes. More than any other mechanism, they ensure that the end-user of energy bears those social costs of development which can be captured through the market mechanism. They do not solve the lead-time financing problem, however, because they flow only after operations have begun. But, they can be pledged to debt service, an alternative which Wyoming just adopted.

But severance or production taxes also have disadvantages. They significantly raise a plant's marginal cost schedule since the fossil material is the major variable input. As a result, since the plant faces a target or contractural price, it significantly reduces its energy output. Alternatively if the price it faces is thereby increased through a "maintenance of value clause" or similar mechanism, then the amount of USG subsidy increases. Also, an inequitable exportation of a State's or locality's tax burden can easily result from their exuberant use. More importantly, they can be applied punitively and be used to discourage or prevent energy resource development.

(b) Efficient use of industry resources may be hampered by certain federal regulations, excessive burdens on industry may conflict with energy policy objectives, or industry may ignore the problems.

There are numerous legal problems with prepayment of ad valorem taxes, including the constitutional "taking issue" and equal protection provisions. Furthermore, prepayments are relatively costly to industry because the Internal Revenue Service (IRS) regulations require that they be amortized rather than expensed. From the state or local point of view, troublesome aspects center on how much of the proceeds will go to which jurisdiction, and what happens if a company prematurely ceases operation.

While industry's guarantee or purchase of bonds would pass the risk onto the industry causing the impact, neither purchase nor guarantee is particularly desirable from industry's point of view. IRS regulations would apparently disqualify a bond issue purchased entirely by a single industry from tax exemption, and such a purchase would probably require Securities and Exchange Commission (SEC) registration. An industry guarantee would require SEC registration, and the state or local bond would become, in effect, a security of the corporation thus encumbering its balance sheet and reducing its capacity to incur debt for direct energy-producing capital. Apparently, such costs could not be passed on to the end-users of energy through the federally regulated rate structures.

If the company were to build a new town itself, the cost of public infrastructure could run as high as $6,000 per capita ($1,500 per capita higher than for additions to existing towns) or $90,000,000 for a town of 15,000. Since the higher costs of public capital in new towns could not be passed-on through rate structures, they will fall on the residents who will consequently demand higher salaries.

While this option involves no direct budgetary outlay, it will likely result in a deeper federal subsidy ($24-143 million) because the higher salaries demanded to compensate for the adverse social and economic impacts and/or the higher costs of public infrastructure and/or higher severance taxes will be passed through to the Federal Government.

2. Require Industry to Provide Infrastructure or Assume the State's or Locality's Unusual Risk

Under this option, a company whose project involves the higher costs of building new towns rather than the lower costs of adding to existing towns would be at a competitive disadvantage during bidding. Therefore, projects with presumably the highest social costs would be discouraged. This would result in either fewer bids or a deeper federal subsidy, directly through price or indirectly through federal loan guarantees if those became necessary to attract bids.

If the project succeeded, new residents lacking the benefits of tax-exempt bond financing would pay higher costs for their public facilities and services. This would probably result in higher salaries, which in-turn would ultimately come from deeper federal subsidies.

Should the project fail, the company would write-off the losses if it still owned the infrastructure and held the mortgages. If federal loan guarantees had been extended for company-provided infrastructure, the Federal Government would assume the loss.

Whether success or failure, then, the Federal Government would either directly assume the risks or indirectly finance a share of public infrastructure under this option.

The estimated capital outlay for public infrastructure by the industry would be $400 - 1,800 million.

The estimated 10 year cost to the Federal Government from the resulting deeper subsidy would be $92 - 410 million, assuming no federal guarantee.

3. Federal Credit on a "Last Resort" Basis, Through Either Existing Authorities or a New Program Specific to Synthetic Fuels

In this option the Federal Government, not the end-user of energy, directly assumes the extraordinary risks.

The credit strategy makes it in the state's or locality's self-interest not to over-build and to install needed legislative and administrative mechanisms for financing and managing their growth.

This option relies primarily on the proper functioning of the tax-exempt bond market, and it is triggered on an exception basis by actual, rather than perceived need when bonding is not otherwise feasible.

Existing federal credit authority, particularly USDA rural development community facilities, industrial development, and water and waste loans could be used as a vehicle for federal credit aid.

Other appropriate federal authorities also exist, but their flexibility, applicability, and comprehensiveness are limited by current policies (new communities have been halted, and the Economic Development Administration (EDA) programs are targeted to declining not growing areas).

Use of rural development loans and other programs may be limited by funding levels not programmed for new energy needs, multi-year and prior funding commitments, eligibility requirements, politically hard state and local reporgramming decisions, and allocation formula based, e.g., on population but not rate of growth.

This option, then, would likely require either an Administration decision to "tilt" the programs to energy problems, thus involving an opportunity cost or budget increases.

New federal credit as part of synthetic fuels legislation could be direct loans, some form of revenue or bond guarantees, or bond purchases and could be extended only when bonds are not saleable below a certain designated price or when an unexpected delay threatens the fiscal stability of a locality. Direct loans from a revolving fund could be structured to encourage industry cost-sharing of planning and certain infrastructure expenditures. (See Tab E for description of recommended guarantee program).

Whether using existing or new credit authority, the cost of a direct loan program would be the difference between Treasury's cost of capital and the loan's interest rate, plus that part of the loan which defaults due to project failure. These costs have been estimated at $53 - 235 million, assuming 30% of needed infrastructure would not be bondable below "a reasonable" price, and $65 - 288 million, assuming in addition that 10% of the projects fail.

The cost of a revenue or bond guarantee program would be the cost of the interest subsidy differential paid if bonds are issued as taxable securities and write-off for default. The estimated cost of the interest subsidy is $14M to $587M. However, Treasury believes that the expected increase in tax revenues (over an equivalent amount of tax exempt financing) would exceed this amount. The cost of 2-6 plant defaults could run $74 to 222M.

4. Federal Grants

Besides being the maximum cost approach, grants have the disadvantage of stimulating over-building. They also run the risk of being notably ineffective as well as inefficient and inequitable in solving the financing problems of states and localities.

The estimated cost of this option could run between $400-1,780 million, assuming 100% grants for all infrastructure.

Comparison of Options By Criteria

	Do Nothing	Company Finances	Federal Credit	Federal Grants
Cost to Federal Government	$24-143M	$92-410	a)$65-288 or b)$74-222 (default) $114-587 (interest subsidy)	$200-890M
Economic Efficiency	low	moderate	moderate	very low
Equity	very low	low	moderate	very low
Private Sector Participation	very low	very high	moderate	none
State & Local Participation	very high	low	high	none
Risk of Over-Development	very low	moderate	low	very high

G. CONCLUSIONS

- The "do nothing" strategy has minimal cost ($25-150 million).

- The "company finances" strategy is more desirable from equity and efficiency standpoints than grant programs, but about the same as credit programs. It will likely result, however, in either fewer bids or a deeper federal subsidy of perhaps $100 - 400 million. Companies will be less able to raise capital for direct energy production to the extent that they finance public facilities. This strategy would tend to discourage those projects with the highest social costs.

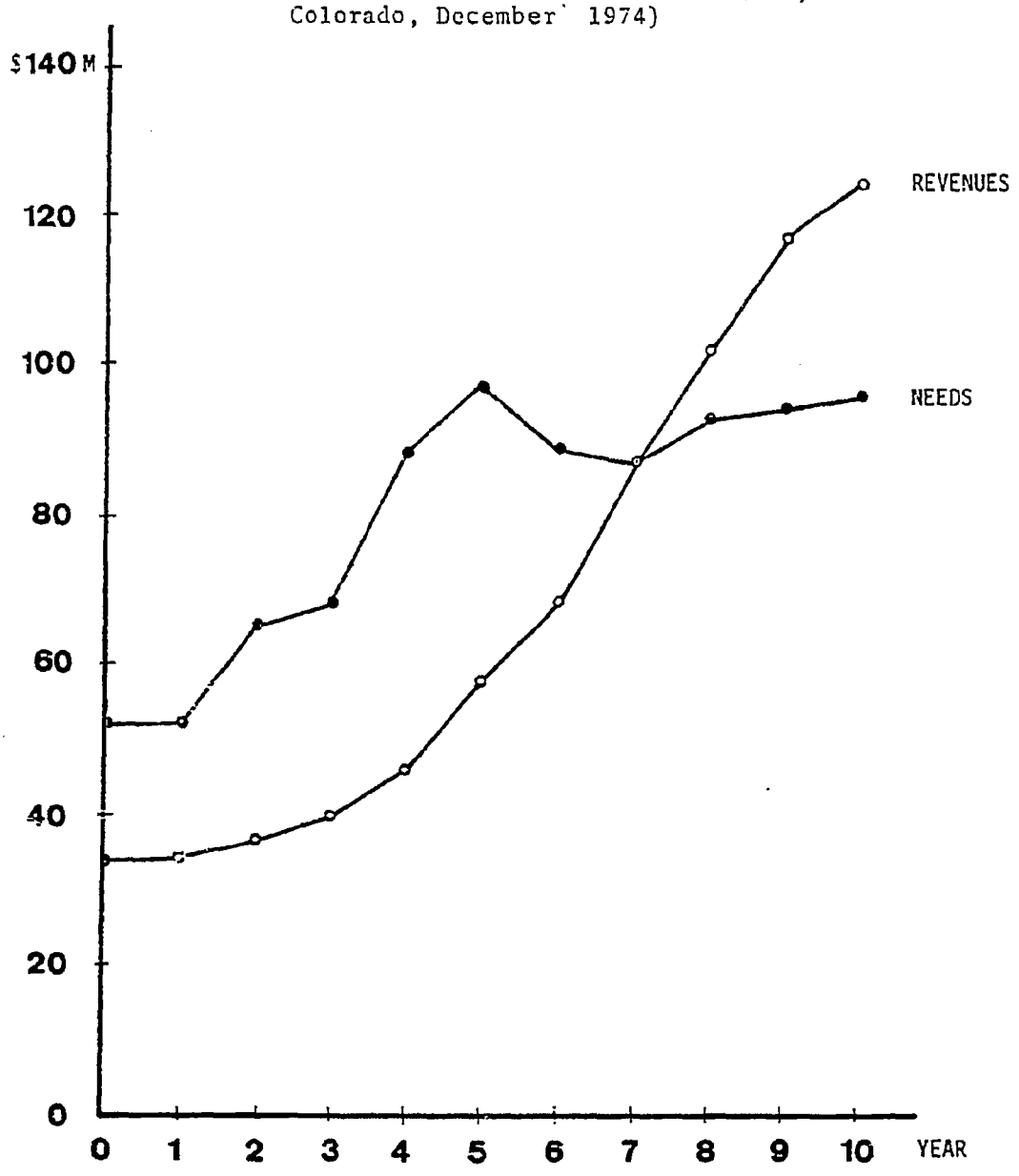
- The "credit" strategy puts the risk burden on the federal taxpayer rather than the end-user of energy, but gives states and localities incentives to put the financing burden on the end-users. This strategy, costing $74 - 222 million, could be targeted to and triggered by actual need.

- The "grants" strategy is the highest cost ($400 - 1,780 million), least equitable (residents and end-users would not pay a "fair share" of their public infrastructure), and the least efficient.

TAB A

TRI-COUNTY TOTAL
REVENUE-EXPENDITURE ANALYSIS

(from "Tax Lead Time Study" by Governor's Committee on Oil Shale, Colorado, December 1974)



Revenues: Dollars available to finance governmental service needs

Needs: Dollars required to meet governmental service needs

POPULATION IMPACTS AND INFRASTRUCTURE COSTS FOR 350,000 bbl/day PROGRAM*

Type Plant	During Peak Construction		During Operations & Mining		Additional** Costs if New Towns Needed	Total Costs
	Population	Costs	Population	Additional** Costs		
Shale 2 Western in remote areas	21,952	$ 66M	21,354	$ 32M	$ 32M	$130M
High BTU 2 Western in remote areas & 1 Eastern (surface mine) in partially developed area	53,760	$162M	23,720	$ 36M	$ 22M	$220M
Low BTU 1 Western & 1 Eastern (underground mine) in partially developed areas & 2 Eastern (surface mine) in well developed areas	4,480	$ 14M	8,795	$ 33M	-	$ 47M
TOTAL		$242M		$101M	$ 54M	$397M

*see following pages
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POPULATION IMPACTS AND INFRASTRUCTURE COSTS FOR 1,000,000 bbl/day PROGRAM*

Type Plant	During Peak Construction		During Operations & Mining		Additional** Costs if New Towns Needed	Total Costs
	Population	Costs	Population	Additional** Costs		
Shale 4 Western in remote areas & 2 Western in partially developed areas	65,856	$198M	64,062	$ 96M	$ 64M	$358M
Syncrude 1 Western & 1 Eastern (surface mine) partially developed areas	26,134	$ 78M	25,820	$ 39M		$117M
High BTU 4 Western in remote areas, 2 Eastern (surface) & 1 Eastern (underground) in partially developed areas	125,440	$376M	64,107	$ 96M	$ 43M	$515M
Low BTU 6 Western in partially developed areas, 2 Eastern (surface mine) fully developed areas 2 Eastern (underground) in partially developed areas	17,920	$ 54M	23,310	$ 59M	-	$113M
TOTAL		$706M		$290M	$107M	$1103M

*see following pages
** " " "

DLB

POPULATION IMPACTS AND INFRASTRUCTURE COSTS FOR
1,700,000 bbl/day PROGRAM*

Type Plant	During Peak Construction		During Operations & Mining		Additional** Costs if New Towns Needed	Total Costs
	Population	Costs	Population	Additional** Costs		
Shale 6 Western in remote areas & 4 Western in partially developed areas	109,760	$330M	106,770	$160M	$ 96M	$586M
Syncrude 1 Western & 1 Eastern (surface mine) in partially developed areas	26,134	$ 78M	25,820	$ 39M	-	$117M
High BTU 4 Western in remote areas, 3 Western in partially developed areas, 3 Eastern (surface mine) & 2 Eastern (underground) in partially developed areas	215,040	$645M	111,548	$167M	$ 43M	$855M
Low BTU 12 Western in partially developed areas, 3 Eastern (surface mine) in fully developed areas, 3 Eastern (surface) & 3 Eastern (underground) in partially developed areas	40,320	$121M	47,109	$102M	-	$223M
TOTAL		$1174M		$468M	$139M	$1781M

*See following pages

** " " "

*A. Permanent population. Assumes $4500 per capita as follows:

	($ per capita)[1]
1. Water (170 gpd/capita)	
Source development	$ 45
Treatment Facilities	130
Distribution & Storage	450
TOTAL	$625 [2]+
2. Sewage and Solid Waste (100 gpd/capita)	
Treatment	$168
Collection System	720
Out Flow Lines	7
Solid Waste	15
TOTAL	$910 [3]+
3. Fire Service	$180 [4]+
4. Libraries	$ 50+
5. Recreation	
Neighborhood Park & Playgrounds	$ 50 [5]
District Park	200 [6]
Regional Park	50 [7]
TOTAL	$300+
6. Police & Security	$ 60+
7. Health	$340++ [8]
8. Education	
Elementary	$480 [9]
Secondary	355 [9]
Vocational	50 [10]
TOTAL	$855++
9. Community and Social Services	$150+
10. Transportation (Roads & Streets)	$400-1000 [11]+
GRAND TOTAL	$3930-4530

FOOTNOTES

1/ Based on standards that meet national association ideal criteria, not existing conditions.

2/ $43 per capita is based on $75 per acre foot. City spread out to average of 1.3 living units per acre, and capital costs per individual meet EPA standards.

3/ Up to 80% of treatment costs available from EPA if time permits. Collection costs would drop significantly if density increased over 1.3 units/acre.

4/ 12 pumpers and 5 ladder trucks within 5 miles for each 10,000 population.

5/ Land donated. $50 assumes 8.5 acres/1000 with $50,000 in facilities.

6/ $60 sq. ft. 2 acres per 1000 plus swimming or other similar facilities.

7/ $500/acre and facilities.

8/ Number of beds needed per 50,000 pop. =203. Cost of 203 bed facility = $17,200,000.

9/ Number of elementary pupils per 50,000 pop. = 7,450. Cost of construction = $23,989,000. Number of secondary pupils per 50,000 pop. = 3,350. Cost of construction = $17,721,500.

10/ Number of people served per 50,000 pop. = 2,100 (300 students in 1/2 day shifts & 1,500 adults in night classes). Cost of facility = $2,376,000.

11/ A "most probable" scenario range of road costs to account for geographical variation.

\+ Estimates based on a study for the Wyoming State Department of Economic Planning and Development by Intermountain Planners & Wirth-Berger Associates.

++ Data from HEW for Under Secretaries Group task force on socio-economic impacts of energy development.

B. Construction population. Assumes cost of $3000 per capita. (Based on analysis done for Wyoming Select Committee which estimates 2/3 of the infrastructure ultimately required would be in place during this phase).

C. New town supplement. Assumes cost of $1500 per capita. (Based on analysis done for Wyoming Select Committee which estimates infrastructure cost 1/3 more if built in new town than added to existing town).

**"Additional Costs" are calculated as follows:

A. $1500 additional per capita for permanent population equal to phase out construction population. Assumes total cost of infrastructure for permanent population is $4500 per capita and that infrastructure built at $3000 per capita for construction population is entirely available for permanent population.

B. $4500 additional per capita for permanent population in excess of construction population.

C. $1500 additional per capita for permanent population if new town is involved.

Assumptions on
Employment, Population, and Plant Sites

	Peak Construction	Operation
Shale Oil	1,470	1,430
Syncrude	1,750	588
High BTU	2,400	713
Low BTU	300	58

Unit Plant Population Impact*

	Peak Construction	Operation
Shale Oil	10,976	10,677
Syncrude	13,067	4,390
High BTU	17,920	5,322
Low BTU	2,240	422

Fuel Mix: Number of Plants by 1985 (TRW Data)

	350,000 Barrels	1 Million Barrels	1.7 Million Barrels
Shale Oil (50,000 CBE)	2	6	10
Syncrude (50,000 CBE)	0	2	2
High BTU (40,000 CBE)	3	7	12
Low BTU (25,000 CBE)	4	10	21

*From draft Environmental Impact Analysis

Assumptions on
Employment, Population, and Plant Sites

	Eastern Underground	Eastern Surface	Western Surface
Syncrude	4,203	1,586	689
High BTU	1,514	571	232
Low BTU	927	350	135

Unit Mine Population Requirements*

	Eastern Underground	Eastern Surface	Western Surface
Syncrude	31,480	11,879	5,161
High BTU	11,342	4,278	1,738
Low BTU	6,943	2,618	1,008

Assumed Mine Location and Type, by Fuel Mix

	350,000 CBE	1 M CBE	1.7 M CBE
Syncrude	-	1 Western 1 Eastern, surface	1 Western 1 Eastern, surface
High BTU	2 Western 1 Eastern, surface	4 Western 2 Eastern, surface 1 Eastern, underground	7 Western 3 Eastern, surface 2 Eastern, underground
Low BTU	1 Western 2 Eastern, surface 1 Eastern, underground	6 Western 2 Eastern, surface 2 Eastern, underground	12 Western 6 Eastern, surface 3 Eastern, underground

* From draft Environmental Impact Analysis

Cost Comparisons of Alternative Options, Worst Case Assumptions

Options	Federal Costs ($M) Information	IMCBE	1.7 MCBE
1. Do nothing	24	87	143
2. Corporate Financing of Infrastructure	92	253	410
3. Federal Credit			
Direct Loans	65	178	288
Interest Subsidy	114	314	587
Guarantees Default	74	148	222
4. Federal Grants at 100%	400	1100	1780

Derivation of Cost Estimates for the Four Options

1. Do Nothing

Assumptions:

- Adverse social and economic impacts result from rapid growth in rural areas and that construction workers consequently will demand a wage premium.
- This premium will be 20% of a $17,500 average wage for the construction phase (three years).
- This premium will be passed onto the Federal government through a deeper subsidy.

Construction Workers Required,* Per Plant

	Year 1	Year 2	Year 3
Shale	156	329	1282
Syncrude	283	495	510
High BTU	202	238	1034
Low BTU	22	49	62

Construction Workers Required, by Fuel Mix

	Information			1M CBE			1.7M CBE		
Years	1	2	3	1	2	3	1	2	3
Shale	312	658	2564	932	1974	7692	1560	3290	12870
Syncrude	283	495	510	566	990	1020	566	990	1020
High BTU	202	238	1034	1414	1666	7238	2424	2856	12408
Low BTU	110	245	310	220	490	620	462	1029	1302
Total	907	1636	4418	3132	5120	16570	5012	8165	27550
Wages at $17,500 ($M)	16	28	77	55	90	290	88	143	482
20% premium =	3	6	15	11	18	58	18	29	96
Total of 3 years premiums		$24M			$87M			$143M	

*from draft Environmental Impact Statement

2. Corporate Financing

Assumptions:

-- The cost differential between financing infrastructure at corporate rates (9%, 20 years) and at tax exempt bond rates (6%, 20 years) will be reflected in higher salaries and will be passed onto the Federal Government through a deeper subsidy. 50% of town employment is due to plant.

	Information	1M CBE ($M)	1.7M CBE
Infrastructure Costs	400	1100	1780
Difference between interest at 9% and 6%	184	506	819
50% higher salaries passed onto USG	92	253	410

3. a) Federal Credit, Direct Loans

Assumptions:

-- 30% of the costs of public infrastructure for both existing and new towns cannot be raised through bonding or normal tax revenue sources.

-- Direct Federal loans will be made at 5% for 20 years and Treasury's cost of capital is 8%.

-- 10% of the direct loans fail in third year.

	Information	1M CBE ($M)	1.7M CBE
Total infrastructure:	400	1100	1780
at 30%=	120	330	534
Cost of rate differential	53	145	235
Cost of 10% failure	12	33	53
	65	178	288

3. b) Federal Credit, Guarantee

- Assumptions:

  -- 75% of costs of infrastructure will be guaranteed.

  -- Treasury rate is 8 1/2% and tax exempt rate is 6%.

  -- Default schedule: 2, 4, & 6 High BTU is new town and 2, 4, & 6 Low BTU in existing town in 10th year of project.

	Information	1MCBE ($M)	1.7MCBE
Total infrastructure	400	1100	1780
75%	300	825	1335
Interest Subsidy for rate differential	114	314	507
Cost of Default	74	148	222
	198	462	809

4. Federal Grants

	Informative	1M CBE	1.7M CBE
@ 100% grants	400	1100	1780
@ 50% grants	200	550	890

Impact Assistance - Program Description

This program incorporates the following principles:

- makes assistance available only where needed,
- makes assistance available when needed (at front-end),
- limits assistance to appropriate purposes and in appropriate amounts,
- is relatively easy to administer,
- relies on State and local decision-making for choice and timing of infrastructure,
- enhances rather than replaces State and local access to capital markets, and
- encourages pass-through of costs of the end user.

Eligibility

- A government jurisdiction is eligible if a major increase in its total population will occur as a direct result of a synfuels commercial demonstration plant and additional public facilities are required.
- In general, there are three types of areas that will be impacted by synthetic fuel plants.

  (1) A well developed area with significant existing population and supporting facilities; the influx of population caused by the synthetic fuels plant would be small in comparison to existing population.

  (2) Areas with some existing population and supporting facilities; the influx of population caused by the synthetic fuels plant would be a major increase to the existing population.

  (3) Areas with little or virtually no population and supporting facilities; the influx of population caused by synthetic fuels plant would be an explosive increase.

Undeveloped and partially developed areas would be eligible. Well developed areas would not be eligible.

° The ERDA Administrator will promulgate regulations on eligibility consistent with the preceding requirements and after consultation with affected State/local governments. The ERDA Administrator will make final determinations on eligibility. No project application would be approved by ERDA unless adequate State/local planning has occurred and adequate provision has been made for financing and any necessary revenue sharing agreements between jurisdictions.

Determination of Public Infrastructure Needs

° The cost of eligible public infrastrucutre needed is expected to be $4,000 per capita.

° In remote, undeveloped locations an additional $1500 per capita may be needed.

° An estimate of total capital necessary for public infrastructure is determined by multiplying the per capita cost by the total plant employment and associated population increase. In addition, this amount will be adjusted for:

-- increases in the costs of construction for the period of construction (the per capita amounts of $4000 and $1500 are based on 1974 construction costs);

-- public infrastructure existing in the area prior to plant construction;

-- density of population existing prior to plant construction.

° If tax revenues will not be available until after loan proceeds are needed, the debt service required during the lead-time can also be borrowed.

Types of Assistance

° The ERDA Administrator will guarantee an annual tax revenue stream from the synfuels plant to the eligible taxing entities up to the annual amount sufficient to amortize over 20 years the debt incurred to provide up to 75% of the eligible infrastructure.

Scope of Assistance

° Can be used only for the following capital facilities located in or near the eligible municipality(s):

Water, sewer and waste treatment;
roads,
schools,
hospitals,
public safety (fire & police).

° Cannot be used to meet any form of operating expenses.

Form of Securities

° Guarantee will be provided if:

-- Interest on bonds will be subject to Federal Income Tax.

-- Municipality(s) agree to earmark sufficient direct tax revenues received from plant (property and other) to amortize debt.

-- Term of debt is limited to 20 years to be fully amortized by equal annual installments.

-- Debt is issued within five years of award of ERDA contract to plant developer.

° Debt instrument is redeemable by guarantor.

° Administrator is authorized to pay interest differential between tax exempt and taxable debt as determined by Secretary of Treasury.

Administration

° ERDA will administer the assistance program, subject to Treasury concurrence in specified areas.

° ERDA will negotiate directly with affected municipalities on the terms and agreements.

° ERDA will consult with State governments.

Example. To demonstrate how the program works, a Colorado oil shale plant would yield tax revenues as follows:

Estimated Cost of Public Infrastructure for one Shale Plant in a New Town	Payment on Debt (20 yr. at 6%, full amortization)	Property Tax Revenew from plant at 75 mills, AV=30% BV	Surplus
$ 66.1 (75%=$ 50M)	$ 5.5M per year (75%=4.4M per year)	$ 9.25M Annual Average	$ 3.4SM Annual Average
	$115M 20 yr. total	$185M 20 yr. total	$70M total