Comments to

Ms. Janice L. Bell
National Environmental Policy Act (NEPA) Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
626 Cochrans Mill Road,
P.O. Box 10940
Pittsburgh, PA 15236-0940.

on the

Draft Environmental Impact Statement for the Gilberton Coal-to-Clean Fuels and Power Project

by

Mike Ewall
1434 Elbridge St
Philadelphia, PA 19149
215-743-4884
catalyst@actionpa.org

February 8, 2006

SCOPE

1) Facility Lifetime Impacts

The scope of EIS is often limited to the construction period and the 3-year demonstration period, without addressing the impacts of the long-term (26+ year) operational life of the refinery. These facility lifetime impacts would be a direct consequence of DOE's decision to fund the project, since the DEIS argues that this funding is necessary to make it possible for the demonstration plant to operate in the first place.

41-1

ECONOMICS

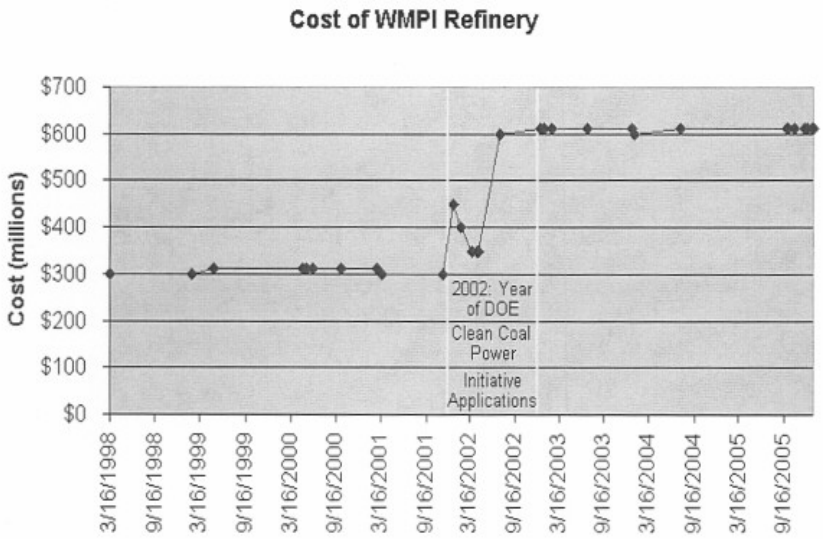
2) Project Cost

The DEIS states that the decision is whether to fund the project with "$100 million (about 16% of the total cost of approximately $612 million)" [xvii]. The projected total cost of the refinery jumped from $300-312 million to $612 million in the year that WMPI applied to DOE for this funding. This issue was raised in the scoping comments but went unaddressed in the DEIS.

No explanation has been given for this near-doubling of project costs and it seems that this increase ought to be properly justified so that DOE can assure that no fraud is perpetrated on federal taxpayers and so that the project can be properly evaluated with regard to the 75% cut-off for repayment. The DEIS doesn't mention this 75% cut-off and ought to be clear about how this cut-off affects the applicant's obligation for repayment.

41-2

The following chart is based on the stated costs of the refinery in over 30 news articles since 1998. Citations of articles for each data point are available online at: http://www.ultradirtyfuels.com/projectcost.html



3) Property Values

The DEIS states on p 4-24 that "because the proposed facilities would be located between an existing power plant and a correctional institution, project construction and operations would not likely decrease residential property values in the county."

No citations are provided to back up this spurious claim. Have real estate agents been consulted? Have any studies of property values relating to industrial facilities been reviewed?

The claim contradicts itself, since it implicitly admits that power plants and prisons have a negative effect on property values. However, the assumption is that property values are already so impacted that they couldn't possibly go any lower – even if a refinery is built that impacts the community with air pollution, noise, traffic, water withdrawal and waste disposal.

It also talks about impacting property values "in the county." Has any county-wide study of property values been done, or is the author just making this up? What about the impacts on property values in Morea, Mahanoy City, Frackville, Gilberton and Shenandoah?

41-3

4) Economic Impacts of Subsidies Ignored

The sections on "Social and Economic Resources" (xxiii, 3.7 and 4.1.7) fail to quantify the impacts of numerous public subsidies in offsetting the "positive effects on employment and income" that "would contribute to the regional economy" (xxiii).

In addition to the $100 million subsidy that this EIS process would lead to, the EIS needs to consider the total public subsidy from:

- $7.8 million from the U.S. Department of Energy's Clean Coal Power Initiative (already awarded) for engineering studies done under Cooperative Agreement DE-FC26-00NT40693 (http://www.netl.doe.gov/technologies/coalpower/gasification/projects/systems/co-prod/cp40693.html)
- $47 million in tax credits from the Commonwealth of Pennsylvania
- $465 million in loan guarantees from the Commonwealth of Pennsylvania (which also ought to be mentioned on page 1-3, where it states that "private sector financing would provide about $465 million")
- An agreement where the state and its trucking association will purchase nearly all of the refinery's product at $1.30/gallon (30 cents more than their cost of production)

41-4.1

- Exemption from all state and local taxes through 2013 through the Keystone Opportunity Expansion Zone program
- Increased stress on local police protection, fire protection, emergency medical services, schools and health care.
- Increased obligation on Pennsylvania's Department of Transportation to address the pending traffic congestion that the DEIS admits "would be particularly acute."

41-4.2

A dollar-for-dollar comparison ought to be made between the projected "positive effects" and the total economic impacts of these public subsidies, so that the net economic impact can be determined.

5) Economic Impacts of Hazardous Waste Determinations

The DEIS assumes that the slag, fine solids and sludges produced by the refinery would all test non-hazardous, therefore not requiring expensive disposal options. The EIS ought to consider the economic consequences of a determination that the slag, fine solids and/or sludges would be considered hazardous waste. If such a determination were made, where would these wastes go for disposal? How much would their disposal cost?

41-5

6) Loan Repayment Details Missing

Page 1-2 describes the 20-year loan repayment period, but leaves out other important details of the loan process. Must the loans be repaid with interest? If so, at what interest rate? Under what conditions would WMPI be permitted not to repay the loan? How would this be impacted by any forgiving of the repayment requirement if WMPI is determined to be providing at least 75% cost sharing?

41-6

7) Unfounded Statement about Significance of DOE Funding

Page 2-19 states: "Without DOE participation, the proposed project would be canceled due to insufficient funding and may not be demonstrated elsewhere."

This statement is unfounded and is contradicted by the following:

- $512 million of the alleged $612 million cost of the project is already covered by tax credits of loan guarantees by the Commonwealth of Pennsylvania. The fact that the Commonwealth of Pennsylvania chose to offer $465 million in loan guarantees is no accident. It's the exact remainder of what they needed to cover the full $612 price tag: $612 million – ($100 from DOE + $47 in tax credits) = $465 million. If the $100 wasn't forthcoming and if private investors weren't willing to take that risk, it's realistic to assume that the Commonwealth of Pennsylvania would cover that remainder, given their heavy commitment to the project.
- According to several news articles available on the UltraCleanFuels.com website, commercial-scale projects are already being considered in Alaska, Colorado, Illinois, Indiana, Kentucky, Montana, Ohio, southwestern Pennsylvania, Virginia, West Virginia and Wyoming. Competing economic interests as well as governors in some of these states are already promoting these projects and it's likely that, with ever-increasing petroleum prices, a full-scale refinery could be built without requiring the $100 million in funds for this demonstration project.
- The Mingo County Redevelopment Authority in Logan County, West Virginia is already doing a feasibility study on a full-scale refinery there. The Authority's director was quoted in the Charleston Gazette on 9/18/2005 stating that the "plant wouldn't hinge on government support" and that: "We don't like to look for the government to fund things for us," he said. "Someone has to be willing to take the risk and get egg on their face if it doesn't work out." (see http://www.ultracleanfuels.com/articles/cgazette_091805.htm for the full article)

41-7

FEEDSTOCKS / FUEL COMPOSITION

8) Anthracite Waste Coal and Petroleum Coke Not Adequately Characterized; Sulfur Contamination Underestimated

The characterization of beneficiated anthracite culm and petroleum coke (Table 2.1.3.) is woefully inadequate. Chlorine is listed, but the values are missing. Data on this is already available via EPA's 1999 ICR dataset (236.78 ppm chlorine in PA's anthracite waste coal and 356.71 ppm chlorine in petroleum coke burned in PA). This was based on an average of 993 and 97 available data points, respectively. Looking at Table 2.1.3., it seems that these figures are based on only one sample for beneficiated anthracite culm and two samples for petroleum coke. Reliance on so few data points is foolish and wouldn't get a passing grade in an undergraduate research project, especially when more complete data is available. EPA's ICR data includes 56 data points specifically from Waste Management & Processors Inc., which would be the most accurate data, as it comes from the same beneficiation plant and same company that would be supplying the beneficiated waste coal. The average ash content in this data set (41.3%) is close to the figure in Table 2.1.3. (a convenient 40.0%, as required for use in Shell's gasifier). However, the btu/lb and sulfur numbers are more divergent. The btu/lb numbers reported by Waste Management & Processors Inc. to EPA in 1999 show 8,061 btu/lb – lower than the 8,340 listed in Table 2.1.3. Most significantly, the sulfur concentration

41-8

(0.47%) is 58% higher than the 0.3% figure in Table 2.1.3. This represents a far higher amount of sulfur entering the process than what is assumed in the DEIS. The numbers for sulfur dioxide air emissions and elemental sulfur byproduct would need to be adjusted upward if the data that Waste Management & Processors Inc. reported to EPA is correct.

There is also no data in the DEIS on most other contaminants of concern in the fuel, including fluorine, bromine, mercury, arsenic, lead, cadmium, chromium and radioactive constituents. All of these and more were mentioned in my scoping comments, but were ignored in the DEIS. The comments named the aforementioned contaminants and asked that other elements which may pose a threat to human health or the environment be evaluated as well, including but not limited to any which would fall under the definition of "contaminant" or "pollutant" as defined by DOE's NEPA regulations, meaning "a substance identified within the definition of contaminant in section 101(33) of CERCLA (42 U.S.C. 9601.101(33))."

41-8

9) Other Feedstocks Not Characterized

The project's "Public Abstract" states:

"The Gilberton Coal-to-Power and Clean Fuels Plant will also test and use alternative feedstocks for economic operation. These would include other coals and/or coal wastes, petroleum coke, biomass, and selected industrial/municipal wastes."

Source: http://www.netl.doe.gov/technologies/coalpower/cctc/ccpi/proposal-pdf/wmpiabs.pdf

Other documents relating to this DOE-funded project mention "other fuels" and "low-value resources" that would be processed by the refinery. One such document uses these terms and states that "process flexibility allows use of coal, coal wastes, petroleum coke, or biomass, alone or as blends" (see http://www.netl.doe.gov/technologies/coalpower/cctc/pubs/Waste%20Management-WMPI-Gilberton-Rnd1Upd1.pdf).

In my scoping comments, I stated that the EIS ought to include the complete chemical composition of each feedstock that would be tested/utilized at the proposed facility. Only beneficiated anthracite waste coal and petroleum coke were covered (inadequately) in the DEIS.

41-9

Other coals, coal wastes, municipal, industrial and biomass wastes have different chemical compositions and pose very different environmental impacts that need to be analyzed. For example, poultry litter and wood waste can contain significant levels of arsenic (from arsenical drugs used in the poultry industry and from copper chromium arsenate wood treatment chemicals, respectively). Details on these specific issues can be found at http://www.energyjustice.net/fibrowatch/toxics.html and http://www.ccaresearch.org. These arsenic levels may exceed that found in anthracite waste coal and could lead to increases in arsenic contamination of air and waste streams. Similar – and not always well-known – chemical contamination issues exist for other waste streams and "biomass" fuels.

If the demonstration project would be test-processing feedstocks other than anthracite waste coal, the EIS is deficient in failing to characterize them.

10) No Mass Balance Provided

My scoping comments included a request for a mass balance, as follows:

41-10

The ultimate disposition of the above elements, providing a mass balance for each element, so that there's no illusion about mercury, chlorine or other contaminants going in, but not coming out somewhere. Include

information on how much of each element will be released through each product or waste stream (i.e. the "ultra clean" fuel, the slag, the stack emissions, etc.) and in what form (how much sulfur would be released as H2S, H2SO4, or in some other form?; how much chlorine would be released as HCl, dioxins, furans or otherwise?).

Without knowing this, it's impossible to evaluate the environmental impact of toxic metals, sulfur, halogenated compounds and radioactive contaminants. It's important to know the levels of such contaminants and the degree to which they'd be present in air and water emissions, solid wastes and fuel products produced at the refinery. Since this can vary depending on the waste/fuel stream, it ought to be performed for each feedstock that the refinery plans to use.

Using EPA's ICR data for the mercury content of anthracite waste coal, it can be determined that about 550 pounds of mercury will enter the refinery each year through the fuel. All of this mercury must come out somewhere. For mercury and the other contaminants mentioned above, the EIS should be clear about where all of it ends up.

41-10

11) Cement Kiln Dust to be Used?

In my scoping comments, I specifically asked that the EIS address whether cement kiln dust (CKD) could or would be used as a limestone source. If it *would* be, the EIS must evaluate the environmental hazards associated with using such a toxic waste stream, specifying whether CKD from kilns burning tires or hazardous waste would be used and how that affects contamination rates. EPA has identified far higher levels of dioxin in CKD from kilns burning hazardous waste. There are more kilns in Pennsylvania than any other state and some kilns in eastern Pennsylvania are already burning hazardous waste or tires.

41-11

12) Limestone Chemical Composition

Since limestone constituents (such as magnesium) can affect the leaching of metals (especially lead) from slag and ash, the EIS ought to include the chemical composition of the limestone that would be used in the refinery, with particular attention to elements than can affect leaching.

41-12

13) Waste Produced in Beneficiation Process Unaddressed

The Shell gasification technology has the flexibility to gasify anthracite culm with an ash content of up to 40%. According to EPA's ICR data, Schuylkill County culm has an average ash content of 52%. This pre-beneficiation ash content isn't mentioned in the DEIS, but ought to be. Of the five waste coal burning power plants in the county, Rich's Gilberton power plant has best average ash content at 41.3% (as a result of the beneficiation plant). However, this fluctuates to as high as 48%. 39 of 56 samples are over 40%. All samples at the nearby St. Nicholas waste coal burning power plant are over 40%, ranging from 58.7% to 72.4% and averaging 66.5%. Clearly, the beneficiation process has a lot of work to do to ensure a consistent feedstock that doesn't exceed 40% ash. The beneficiation plant will need to produce a large volume and tonnage of waste (mostly rock) in the process of producing a reliable feedstock for the refinery. Since the beneficiation process is so integral to the refinery project, its impacts ought to be better examined.

The following questions should be answered in the EIS:

- What is the amount of unprocessed (pre-beneficiation) waste coal (in volume and tonnage) that would be needed per day (and per year)?
- What volume and tonnage of waste product would be produced in the beneficiation process per day and per year?
- Where will this waste end up?

41-13

- How much dust will be created in the beneficiation process? How would this affect people in nearby Gilberton?
- Of the 386 gal/min of mine pool water used in the beneficiation process (2-13), how much ends up in wastewater?
- It the amount and source of water use for beneficiation included in the water withdrawal permit from the Susquehanna River Basin Commission?
- What is the chemical composition of the waste water produced by the beneficiation process?
- Where would this waste water end up?

41-13

14) Is There Sufficient Anthracite Waste Coal in the Area?

Page 2-2 states that "the primary feedstock would be low-cost anthracite culm, which is a locally abundant, previously discarded resource (about 100 million tons) that could accommodate fuel requirements throughout the approximate 26-year lifetime of the facilities."

This often-cited 100 million tons figure deserves a closer look. The proposed refinery would be in the epicenter of its competitors. Three other waste coal burning power plants exist in the immediate vicinity and a total of eight exist in eastern Pennsylvania – five in Schuylkill county and three others, all in counties bordering Schuylkill. The "about 100 million tons" could feed the refinery for a 26 year "lifetime" if there were no competition. However, if these waste coal burners continue to operate, 100 million tons will only last about 16 years.

There are a handful of factors that could indicate a lack of adequate supply of anthracite waste coal for the refinery:

- Waste coal burning power plants are lasting longer than their initially-intended lifetimes. The Westwood Generating Station, the nation's first waste coal power plant, was built in 1987 and was intended to last only 10 years (which is why their power purchase agreement was set to expire in 1997). However, the plant has continued to operate, despite not being economically viable, to this date – 9 years after it was meant to shut down. Given the economic incentives being created for waste coal burning as an "alternative energy" in Pennsylvania, it's likely that these power plants will continue to operate well past their intended lifetimes. As these power plants continue to operate, they represent significant competition for the same waste coal supplies in the same region.
- The waste coal piles in the region have been picked and re-picked for usable coal many times over past decades. The btu value of the piles is diminishing over time and may be overestimated.
- Some waste coal piles have suffered from fires and the carbon value in those piles would be diminished as the burnable coal within them has been burned out by these fires.
- Beneficiation (used by the Gilberton plant and required for the refinery) reduces the amount of burnable waste coal by segregating some of the rock in the waste coal before burning. Since the 100 million tons estimate isn't a post- beneficiation estimate, the amount of burnable beneficiated fuel in that figure is smaller than it would otherwise indicate.
- Waste coal piles are economically unrecoverable if they are further than 20-50 miles from the power plants or refineries that would use them. This is because the costs of trucking this low-btu fuel become too high, compared to bringing in cheaper western coals by rail. Distance and economic recoverability may place limits on the extent to which the "about 100 million tons" can be used.

41-14

Aside from petroleum coke, which may also be in short supply or which may not be economical for replacing waste coal as a primary fuel, the EIS should spell out what the most likely secondary or primary fuels would be over the lifetime of the refinery.

WATER ISSUES

15) Subsidence Downplayed

Page 4-13 states: "The facilities' use of water from the Gilberton mine pool would lower the average water level in the mine pool, and thus reduce roof support in the abandoned mine workings below Gilberton. However, this would not be expected to increase the likelihood of collapse. Water levels would remain within their current range…."

41-15

These statements are contradictory. First, they admit that mine pool levels would drop and reduce roof support, then they pretend that this wouldn't increase likelihood of collapse. The EIS ought to discuss the fact that water would be returned (via the tailings pond) to a different (but connected) mine pool. The Susquehanna River Basin Commission, in its water withdrawal permit for the WMPI refinery, states the possibility that the water withdrawal could lower the water level significantly enough that WMPI may need to seek additional permits to withdraw water from other locations. It also states that the mine pools may not be as connected as some believe.

The permit states:

"Long-term hydrographs of the few available boreholes in some of the mine pools confirm that barrier pillars between the various mine pools have not all been breached or so severely compromised so as to allow free flows of groundwater among the mine pools." (p2)

41-16

"If the pumping water level in the Gilberton Mine Shaft reaches 1,087 feet AMSL, the project sponsor shall submit its projections and evaluation of anticipated additional drawdown. Should the evaluation show that the water level will decline below 1,084 feet AMSL, the project sponsor shall submit the appropriate application(s) for supplemental withdrawal locations." (p8)

16) Mine Pool Contamination Not Mentioned; Chemical Analysis Incomplete

Table 3.4.2. provides a chemical analysis of Gilberton mine pool water, but fails to include lead levels, which are now known to be quite excessive (check PA DEP's own groundwater monitoring reports). A chemical analysis should be provided for various depths within the mine pool and – based on the trace elements that are concentrated in and that have leached out of waste coals – should include aluminum, antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium and zinc. Major parameters should also include tests for acidity and alkalinity.

41-17

17) Wastewater Toxins Downplayed

Page 4-16 states: "Toxic and carcinogenic substances, including cyanides and polycyclic aromatic hydrocarbons (PAHs) such as pyrene, might be present in low concentrations (SAIC 2002)."

Toxic and carcinogenic substances – particularly metals – accumulate in the environment and are often toxic at "low concentrations." Dismissing their impacts by stating that they're in "low" concentrations and claiming that their impacts won't be noticed because the impacts of acid mine drainage are more noticeable is irresponsible and is bad science. Please explain what "low concentrations" means in terms of the ability of these substances to cause health effects in those exposed. Do so using the current scientific knowledge, not government standards that have been set years ago based on a combination of politics and earlier scientific understanding of health effects. Also, the EIS ought to differentiate those which are persistent and bioaccumulative toxins (PBTs) from those which would readily and naturally degrade. PBTs ought to be evaluated in terms of what the levels would be after a 26-year project lifetime.

41-18

18) Tailings Pond Contamination Not Discussed

1,867 gallons of wastewater would be dumped in the tailings pond every minute (p2-13). Even if the contamination levels in this waste water are "low," this represents a significant amount of toxic discharges over time. Figures ought to be provided for the chemical composition of the waste water discharges. This data already has been filed with PA DEP on 2/18/2005 in their Water Quality Management Part II Permit Application. 41-19

The DEIS provided no baseline analysis of existing contamination in the tailings pond and soils. The EIS ought to establish the current loading of metals and other toxic substances in the tailings pond as well as estimates of the expected increases over the 26 year projected lifetime of the facility. Borings done on the tailings pond should evaluate both by leach test *and* by total content of each contaminant present in the soils. 41-20

The following sections of the DEIS allude to the fact that contaminants would be transferred to the tailings pond and these sections ought to be made clear about this fact. The baseline testing and project lifetime contamination estimates for the tailings pond ought to include all contaminants mentioned in 4-16 and 4-33 as well as a panel of all relevant metals (at least those discussed in comment #16 above).

2-16: *"**Suspended solids** included in the effluent would be trapped within the tailings pond and would not percolate to the mine pool."*

2-21: *"Discharge of treated effluent to the mine pool by seepage from the tailings pond would be expected to improve mine pool water quality by reducing concentrations of **acidity and dissolved metals**."*

4-16: *"Although the facilities' wastewater treatment system would be designed to treat organic residues (Section 2.1.6.2), effluents from the facilities could contain residual amounts of **organic compounds** found in process wastewaters. **Toxic and carcinogenic substances, including cyanides and polycyclic aromatic hydrocarbons (PAHs) such as pyrene**, might be present in low concentrations (SAIC 2002)."*

4-33: *"Operation of the proposed facilities would generate several different liquid wastes requiring treatment or control. Liquid wastes from the gasification and liquefaction processes would hold **various impurities** collected in processing, offgas cleaning, and solid waste processing. Process wastewaters would have **high organic loadings** and would require treatment for substances including **methanol and other alcohols, formates, ammonia, formic and acetic acids, cyanides, sulfides, and chlorides**. Stormwater runoff collected from the facilities, coal piles, and other areas would require removal of **oil and grease** and other contaminants. Wastewater from demineralization of mine pool makeup water would have high concentrations in dissolved substances removed from the mine pool. Contaminants in wastewater released from the cooling water system would include **proprietary biocides, corrosion and scale inhibitors (such as phosphates), chlorine, and other substances injected into the makeup and circulating streams to inhibit corrosion and fouling, together with high concentrations of dissolved solids (such as sulfates) not removed during initial water treatment.**"*

41-21

WASTE ISSUES

19) Solid Waste Production Numbers Don't Match DEP Permit Application Documents

The DEIS may be dramatically underestimating solid waste production.

Page 2-7 states: *"The gasification facilities would... produce daily about 800 tons of coarse slag and 200 tons of fine solids on a dry basis."*

Page 4-29 states: *"Slag generated by the gasifier... would be generated at a rate of 1,600 tons per day (wet weight) or 800 tons per day (dry weight)."*

41-22

However, Appendix 1 (pA-6) in the Water Quality Management Part II Permit Application dated 2/16/2005 and received by PA DEP on 2/18/2005 states: *"The gasification plant also produces 2024 tons per day of slag (dry) and 164 tons per day of soot (dry)."* This is a 153% increase in tonnage of slag (dry measurement) over the numbers offered in the DEIS.

Also, the Storage Tank Site Specific Installation Permit Application (version 2), dated 1/14/2005 and received by PA DEP on 9/15/2005 states in the Emergency Response Plans, Appendix A, in a table titled "WASTE INVENTORY – Major Solid Waste Streams," that the gasification utilities will produce 133,800 lbs/hr of "drained course slag" and 41,900 lbs/hr of "fine slag filter cake." In a 24 hour day, this totals 1,606 tons per day of slag (possibly by dry measurement, given the term "drained") and 503 tons per day of fine slag filter cake.

These inconsistent numbers need to be corrected so that these two pending DEP applications match each other and the EIS. Once the proper figures are determined, the annual solid waste production figures in Table 2.1.1. would need to be revised.

41-22

20) Slag Color Doesn't Match Company's Statements

In media statements, the company has repeatedly described the slag as looking like "crushed brown glass."

Some of these statements can be found in news articles through the company's own website:
http://www.ultracleanfuels.com/html/a17.htm
http://www.ultracleanfuels.com/html/a18.htm
http://www.ultracleanfuels.com/html/a19.htm
http://www.whitehousechronicle.com/newsmaker/ed/ed_media03222002/ed_media03222002.ram

The DEIS (p4-29) describes the slag as "slag, which would be black in color and granular (sand-like) in form…."

Please resolve this color discrepancy.

41-23

21) Fine Solids and Sludge Dump Site Not Fully Disclosed

Various landfills in the region are specified by name and with township and county locations (3-29), but on pages 2-1 and 2-18, where it describes the dump sites for fine solids and sludges, it's not as specific, stating either "WMPI land" or that they'd "be trucked to the adjacent valley to the northeast for placement in a permitted ash disposal area on WMPI land." Please be specific in identifying the actual site name, landowner and permittee, as well as the township and county location. The landowner is probably not actually WMPI. The landowner for the refinery property isn't even WMPI, but another company related to John Rich: GCC Realty, Inc.

41-24

22) Leach Test Methods Inconsistent

Page xxvi in the summary states that the Toxicity Characteristic Leaching Procedure (TCLP) test would be used to determine hazardous waste designation for the facility's solid waste streams. Pages 4-30 and 4-31 discuss the Synthetic Precipitation Leaching Procedure (SPLP) and give the impression that the SPLP test might be used for the refinery's solid wastes. Please clarify which tests would be used.

41-25

23) Leach Test Methods Improper for Characterizing Hazardous Nature of Solid Wastes

Laboratory leach tests aren't accurate indicators of real-life leaching of hazardous constituents from wastes. This is particularly true for lead, which has a U-shaped solubility curve and where mild acids are used in lab tests on waste products that include lime. These lab tests bring the alkaline pH back down to a neutral area where lead won't leach in the one-day tests, but in real life long-term exposure to changing pH, significant amounts of lead will leach out. This is described in Waste Not #317, March 1995, titled "The Great Incinerator Ash Scam Part 3." (http://www.workonwaste.org/wn317.htm or http://www.workonwaste.org/wn/317.pdf).

A report by the Electric Power Research Institute (cited below) shows that the results of field monitoring of gasification slags showed concentrations of iron, sulfur, manganese and other pollutants several orders of magnitude higher than occurred in parallel leach tests on the same waste.

EPA's Science Advisory Board is currently grappling with the limitations of laboratory leaching tests in predicting what industrial wastes like gasification slags will do in the disposal environment.

Laboratory leach tests like the SPLP in Table 4.1.2 which is used to okay dumping of coal ash and other residual wastes in coal mines in Pennsylvania with little safeguards, should never be considered reliable much less sole predictors of what coal ash or other residual wastes such as coal gasification slags will do in different disposal settings. The report *Long-Term Leaching Tests With Coal Gasification Slag* prepared for the Electric Power Research Institute by RADIAN CORPORATION (GS-6439, Research Project 2659-2, Final Report, July 1989) documents that concentrations of iron, manganese, sulfates and other pollutants found in field monitoring wells at the bottom of cells containing gasification slags from plants of the type being proposed here, were in many instances, several orders of magnitude higher than concentrations of these pollutants in leachate from long-term leach tests done concurrently on the same slags. Concentrations of iron, manganese, sulfate, boron, chromium, silver and selenium at the bottom of the field cells and in surface waters draining the cells studied in this report were often several to many times over federal drinking water standards and corrective action standards used in most state residual landfill regulations. Given there are no isolation requirements, no corrective action standards and scant monitoring proposed for the slag wastes from this plant under permit 54850202, this EIS must present more substantive evidence to back its repeated assertion that this slag will not leach harmful levels of contaminants where its placed other than just saying that it will leach lower contaminant concentrations than the Gilberton coal ash, "due to the physical differences between slag and ash." This evidence should be based on actual field results, which are available in research, not postulated from benchmark laboratory leach tests.

41-26

The EPRI report shows that field monitoring results are higher than leach tests would indicate. Water in field tests (leachate in the bottom of a cell) had 810,000 ppb of iron, but the ASTM Extract (deionized water) test, which is similar to the SPLP test, showed only 9 ppb.

Since the political bodies are in the process of catching up with the science on this, it's realistic to assume that – over the lifetime of the proposed refinery – regulations will change that would require more accurate and realistic tests. Such tests would likely lead to a determination that gasification slags should be handled as hazardous waste. Given the significant economic implications – as well as the implications for how and where the slag would need to be brought for disposal – the EIS ought to examine this more thoroughly and not only through the lens of current laboratory leach test methods.

[The remainder of this section is borrowed from the working review draft of "Environmental Characteristics of Coal-Based Integrated Coal Gasification Combined Cycle (IGCC) Power Plants," prepared by Rui Afonso, Environmental Strategies, Inc.; Martha Keating, Keating Environmental Services; John Thompson and Joe Chaisson, Clean Air Task Force.]

A primary environmental concern is that toxic substances could leach out of slag. The test that is used to determine RCRA applicability for toxicity is the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP is the EPA test method used to evaluate the leachability of metals, organic compounds and pesticides from wastes into groundwater. The TCLP is a batch test developed by EPA in response to deficiencies in an earlier test, the Extraction Procedure (EP). Many of the assumptions used in developing the EP were retained, however, and the TCLP is also widely considered to have serious limitations. In principle, the TCLP simulates the leaching of constituents from the waste into groundwater under conditions found in a municipal solid waste landfill.

However, the TCLP has been widely criticized when it has been applied to wastes other than municipal solid waste and in disposal settings other than municipal waste co-disposal.[1]

The EPA's Science Advisory Board has criticized the TCLP protocol on the basis of several technical considerations, including the test's consideration of leaching kinetics, liquid-to-solid ratio, pH, potential for colloid formation, particle size reduction, aging, volatile losses, and co-mingling of the tested material with other wastes (i.e., co-disposal).[2] Specific limitations of the TCLP are:[3]

- TCLP underestimates leachate from some high alkaline wastes or environments.
- TCLP underestimates the leachate concentrations from oily wastes and paint wastes.
- TCLP does not account for waste disposed of in a monofill.
- TCLP may underestimate the chelation-facilitated mobility of some waste constituents.
- TCLP does not account for oxidation/reduction reactions occurring in landfills.
- TCLP may not predict the long-term mobility of organic constituents in some treated wastes.
- TCLP may not be appropriate for contaminated soil.
- TCLP does not predict releases to non-groundwater pathways.

41-26

Despite these limitations, the TCLP continues to be used to predict the leaching trends of different types of waste. It is also the test that most State governments routinely mandate in order to classify wastes as either hazardous or non-hazardous. This in turn determines how the wastes may be disposed of or reused. Other leaching methods are also available or are under development. These include the synthetic groundwater leaching procedure, the multiple extraction procedure, the synthetic acid precipitation leach test and the California waste extraction test.[4] The U.S. EPA is also currently utilizing a new multi-tiered testing framework in a research program designed to evaluate the potential for mercury release from various types of coal combustion wastes.[5] The alternative framework evaluates the potential leaching of waste constituents over a range of values for parameters that affect the leaching potential. However, while all of these new tests are intended to provide a "true" indication of the leachability of waste constituents, there is still no substitute for field data from actual disposal or reuse sites.

Tests of coal gasification slags have found that these slags are similar in composition to pulverized coal boiler slag. As with boiler slag, the IGCC slags are non-leachable using the TCLP test. However, some

[1] Science Advisory Board, 1999. "Waste Leachability: The Need for Review of Current Agency Procedures". February 26, 1999. EPA-SAB-EEC-COM-99-002. http://www.epa.gov/sab/pdf/eecm9902.pdf
[2] SAB, 1999.
[3] U.S. EPA, 1996. "Hazardous Waste Characteristics Scoping Study." Office of Solid Waste and Emergency Response. Washington D.C. http://www.epa.gov/epaoswer/hazwaste/id/char.htm
[4] American Coal Ash Association, 1997. "A summary of leaching methods." Prepared by Susan S. Sorini, Western Research Institute. April.
[5] Kosson, D.S., et al., 2001. "An integrated framework for evaluating leaching in waste management and utilization of secondary materials". Review Draft submitted to Environmental Science Engineering. December.

limited field data are available from a long-term leaching test with coal gasification slag.[6] These data illustrate the inability of laboratory tests (in this case the EP that pre-dates the TCLP test) to predict the potential real-world behavior of these wastes when landfilled. The tested slags were non-hazardous according to the EP toxicity criteria. However, the elemental concentrations measured in the laboratory extracts did not correlate well with the concentrations in the field test cell waters. Concentrations of the eight RCRA trace metals were well below concentrations that would cause the wastes to be classified as toxics according to the EP criteria. However, field measurements found that the Maximum Contaminant Limits (MCL) set by federal regulations were exceeded consistently for chromium and silver in leachate samples and selenium in surface water samples collected during the first months of monitoring.[7]

In addition, concentrations of iron, manganese, sulfate and dissolved solids were significantly above secondary MCLs (levels meant to protect aesthetic qualities of water) in leachate from all tests cells. The study also found that chemical reactions were occurring that produce acid mine drainage and that some components in the gasification residues were transferred to waters in contact with the solids. 41-26

The study recommends that "proper engineering controls should be applied to coal gasification solid residue disposal sites ensure that ground water concentrations of species for which secondary MCLs have been established do not exceed acceptable limits."[8]

Considerable additional information on slag leaching and toxicity apparently exists that has not been released publicly, but that might help better characterize IGCC slag's environmental characteristics. Much relevant slag leaching data was also apparently filed in an EPA Docket several years ago that cannot now be located by EPA. It would probably be quite useful for the relevant parties to review these data and determine if they could be released in some form, if they could address some of the questions raised by the publicly available data.

24) Data on Gilberton Power Plant Ash is Unrepresentative; Lead and Mercury Levels Too Low

Table 4.1.2. is based on only one sample, presumably picked due to its unrealistically low numbers. The EIS should not list any chemical composition or leach test results from single tests. Averages and ranges from larger sets of data should be used in order to be more accurate and scientifically credible. 41-27

PA DEP's groundwater monitoring documents show significant contamination of mine pool water from the dumping of Gilberton Power Plant's waste coal ash. When reviewing their data to finalize the EIS with credible information, be careful to accurately analyze which monitoring wells are upgradient and downgradient, since DEP labels some wells that are downgradient of ash dump sites as upgradient. 41-28

The DOE should be presenting the data from leach tests in its own data base of such test results for the coal ashes dumped in Pennsylvania mine fills under the Module 25s of those dumping permits, not just presenting the data from presumably one test completed by Hawk Mountain Labs, Inc. in Table 4.1.2. on page 4.31. The much more substantive data from this data base reveals that the FBC waste coal ash produced by the Gilberton Cogen Plant leaches more lead than any other coal ash tested in the DOE data base. The average lead concentration leached in 12 tests on Gilberton ash was 0.271 mg/L, (18 times the federal Drinking Water Standard), compared to an average lead concentration of 0.14 mg/L, (9 times the federal Drinking Water Standard) leached in 71 tests on all other coal ashes in the data base. Even more significant than comparing the averages in this instance however is that the range of lead concentrations leached from the 41-29

[6] Electric Power Research Institute, July 1989. "Long-term leaching tests with coal gasification slag". GS-6439, Research Project 2659-2. Final Report. Prepared by Radian Corporation and Tennessee Valley Authority for EPRI.
[7] EPRI, 1989.
[8] EPRI, 1989, at page iv.

Gilberton ash was 0.128 mg/L to 0.520 mg/L compared to a range of 0.001 mg/L to 0.49 mg/L of lead leached from all of the other coal ashes in this data base.[9] 41-29

The rise in dissolved lead concentrations in the three coal ash monitoring wells operated under permit 54850202 from levels below Drinking Water Standard before ash placement to levels many times over the Drinking Water Standard after ash placement started at this site must be recognized in this EIS and accounted for. These monitoring points are monitoring very large volumes of water in minepools downgradient of the ash placed under this permit. What other sources would have contributed this lead to the mine pool other than the Gilberton coal ash? Data should be presented that substantiates that another source is more likely to have contributed this lead to the minepool, particularly given the assertion on page 4-30 that this gasification slag will come from the same culm that is burned to generate the Gilberton ash. 41-30

Table 4.1.2. lists mercury concentrations in Gilberton Power Plant ash as 0.2 ppm. This is impossible, unless the Gilberton Power Plant is releasing huge amounts of mercury into the air. EPA's ICR data (364 samples) shows waste anthracite in PA to be 0.19 ppm mercury. The 151 samples just from Schuylkill County average 0.18 ppm mercury. The 56 samples specifically from the Gilberton Power Plant average 0.235 ppm mercury. Since metals tend to concentrate in the ash, it's impossible for the levels of mercury in the ash to be as low as 0.2 ppm – lower than the waste coal that went into that power plant. 41-31

The data provided for Table 4.1.2. is clearly unrepresentative of the actual ash produced.

25) Comparisons Ought to be Made to Similar Waste Streams (Coal Gasification Slag)

Comparing gasification slag to Gilberton Power Plant ash – if accurate data is used – could be somewhat relevant, but it would make more sense to include data from actual coal gasification slag. Leaching data exists on the slag from the Great Plains Coal Gasification Plant, located in Beulah, Mercer County, North Dakota. It can be found in Chapter 5 of EPA's 1990 Mineral Processing Waste Report to Congress here: http://www.epa.gov/epaoswer/other/mineral/chapter5.pdf The full report is here: http://cfpub.epa.gov/compliance/resources/publications/assistance/sectors/minerals/processing/reportstocongress/

Affirming my previous comments about how SPLP and TCLP leach tests underestimate leaching concentrations, page 5-5 of this report shows that, on balance, the EP leach tests show greater leaching results, both at higher levels and for a greater number of contaminants:

"Among EP results, arsenic, barium, chromium, and silver concentrations vary by more than two orders of magnitude. In addition, maximum leachate concentrations of many constituents (i.e., arsenic, barium, cadmium, chromium, copper, lead, manganese, selenium, and silver) detected in EP leach tests are approximately 10 times higher than concentrations detected by SPLP or TCLP analyses. Conversely, concentrations of aluminum, iron, uranium-238, and vanadium detected by SPLP analyses are greater than approximately five times the highest EP and TCLP concentrations." 41-33

On page 5-9, the report goes on to show that several toxic contaminants leach from the gasification slag (described in the report as "ash") at levels that would be harmful to human health and the environment:

"Of the 58 constituents analyzed in the ash solids, only uranium-238, thallium, arsenic, and chromium concentrations exceed the screening criteria. Among these constituents, uranium-238, thallium, and arsenic

[9] Cardone, Carol R. and Ann G. Kim, 2000, Assessment of Coal Combustion By-Products and Water Quality Variations at Mine Sites, U.S. Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA in Proceedings of the Use and Disposal of Coal Combustion By-Products at Coal Mines: A Technical Interactive Forum. Ed. Vories, Kimery C. and Dianne Throgmorton, U.S. Department of the Interior, Office of Surface Mining, April 10-13, 2000 Morgantown WV.

exceed the screening criteria with greater frequency and magnitude. However, only arsenic is present at a concentration that exceeds a screening criterion by a factor of more than 10....

- *Uranium-238 concentrations exceed the radiation screening criterion by a factor of almost 4, suggesting that the ash could pose an unacceptable radiation risk if the ash were used in an unrestricted manner (e.g., direct radiation doses and doses from the inhalation of radon could be unacceptably high if people were allowed to build homes on top of the ash or if the ash were used for construction purposes).*

- *Uranium-238, arsenic, and chromium concentrations in the ash may be present in concentrations that exceed the inhalation screening criteria. This suggests that if small particles from the ash are blown into the air in a high concentration (equal to the National Ambient Air Quality Standard for particulate matter), chronic inhalation of these constituents could cause a cancer risk exceeding 10^{-5}....*

- *Thallium and arsenic may be present in the ash at concentrations that exceed the incidental ingestion screening criterion, suggesting that these constituents could pose health risks if small quantities of the ash are routinely ingested over a long period of time (i.e., more than about seven years). Arsenic concentrations could pose a cancer risk of greater than $1x10^{-5}$, while thallium concentrations could cause adverse central nervous system effects.*

Of the 24 constituents analyzed in the leach tests, the following 10 constituents are present at concentrations that exceed the screening criteria based on water pathway risks: arsenic, lead, silver, selenium, mercury, chromium, sulfate, aluminum, molybdenum, and barium. All of these constituents are inorganics that do not degrade in the environment. Arsenic, silver, and lead are of relatively greater concern because their concentrations in the ash leachate exceed the screening criteria with the greatest frequency and magnitude. Arsenic concentrations exceeded the human health (drinking water) screening criterion in almost 60 percent of the samples analyzed; the median arsenic concentration exceeded the criterion by a factor of 8, and the maximum exceeded by a factor of 1,100. Silver concentrations exceeded the aquatic ecological screening criterion in 12 percent of the samples, and the maximum silver concentration exceeded the criterion by a factor of 370."

41-33

26) Where Would Wet Sludge be Contained?

Page 4-32 states that "earthen berms or dikes could be needed to provide effective management for the large quantities of wet sludge." Where would these be located? Would they be lined? Double-lined? Is there currently no plan for managing these wastes?

41-34

27) Where Would Dewatering Take Place?

Page 4-32 states that "if sludges were transported to commercial landfills routinely, additional dewatering would probably be conducted to reduce weight and the potential for release of water after delivery." Where would this dewatering process take place? Would the World Resources Corporation facility in the county be utilized for this purpose?

41-35

28) Inadequate Groundwater Protection for Waste Disposal

Section 4 states that requirements of Pennsylvania residual waste management regulations (25 Pennsylvania Code Chapter 287) will be used to "minimize the potential for adverse impacts to water quality form management of the slag residue." (page 4-29)

Yet what it does not point out is that the refuse reprocessing permit 54850202 that governs the WMPI land in Mahanoy Creek Valley where the slag will be placed with ash from the Gilberton Cogen Plant, is a minefill

41-36

permit issued by PADEP that is exempt from meeting most basic requirements in the Pennsylvania residual waste management regulations (25 Pennsylvania Code Chapter 287). 41-36

There are no intermediate capping requirements, leaving the waste exposed to precipitation and leachate generation for extensive time periods in permit 54850202. There are no liner requirements preventing leachate from percolating directly from the slag into aquifers and the Boston Run, St. Nicholas and Gilberton minepools underneath the site governed by permit 54850202. Were the regulators to decide to dump the slag into the regional water table or the mine pool, they would be exempt from having to demonstrate that no groundwater contamination would occur, because permit 54850202 is likely a "mine drainage abatement project" exempt from this requirement touted on page 4-29 and 4-30 by the regulations (see Section 287.663(d)(6)). 41-37

Unlike PA residual waste landfills, there are no corrective action standards in permit 54850202 that would require any response from the regulator, slag generator or mine operator no matter how high contamination levels become in downgradient monitoring wells, and there is no requirement to monitor for any longterm period after the site has been filled with slag and coal combustion waste. Monitoring under permit 54850202 will stop when the Phase II mine bond is released, i.e., when the site surface has been revegetated to specified performance standards which can be 1-2 years after the waste filling at the site has concluded. Monitoring will not continue for 10 more years through a post closure monitoring period as is required for PA residual waste landfills (see Section 287.314 in the regulations). 41-38

There are only three downgradient ash monitoring points under permit 54850202 and no upgradient monitoring points. This allows state mining regulators and the site operator to assert conveniently that culm mining is polluting the waters instead of coal ash, regardless of how severe contamination of waters becomes. A review of monitoring data at this site reveals that the minepool water underneath this site is being substantively degraded with levels of pollution that did not occur 18 years ago before ash from culm remining was being placed at this site, under permit 54850202. Does the DOE believe that the monitoring system at this site will be sufficient to monitor impacts, identify the sources of those impacts and responds to them given its admission on page 4-29, "Contaminants potentially can leach into groundwater or surface water when solid byproducts are used in the environment." 41-39

The bond for permit 54850202 is calculated to cover only the costs of reclaiming the original contour of the surface mine and revegetating its surface to certain standards and includes virtually no resources for monitoring or remediating contamination of groundwaters or surface waters resulting from coal ash or slag placed at the surface mine at this site. Thus the bond does not include the costs covered in Section 287.331(c) of the regulations for residual waste landfills which emphasize that funds for monitoring and abatement of pollution are set aside in the bonds for coal ash landfills.

The result is that surety bonds ranging from $3,463,000 for Greene County's Hatfield Ferry coal ash landfill (which can accept up to 2.2 million tons of ash on 187 acres) to $20,741,700 for the Montour Power Station's coal ash landfill near Washingtonville, PA (which can accept a capacity of 4,992,221 tons of ash on 64 acres) compare to a total bond for permit 54850202 of $1,402,953 (for a site containing 3.7 million tons of ash on 125 acres). And permit 54850202 is slated to take more coal combustion waste as well as this gasification slag without any indication that this bond value needs to be raised. 41-40

Ash Dump Site	Capacity	Surety Bond
Greene County's Hatfield Ferry coal ash landfill	2,200,000 tons	$3,463,000
Montour Power Station's coal ash landfill near Washingtonville, PA	4,992,221 tons	$20,741,700
Permit 54850202 site in Schuylkill County	3,700,000 tons	$1,402,953

AIR EMISSIONS

29) Dioxins / Furans Not Addressed

In my scoping comments, I asked several specific questions about dioxins and furans. No mention of dioxins or furans were in the DEIS. My comments asked that the EIS cover:

- The potential for formation of dioxins and furans throughout the process. This must include an understanding of:
  - where halogens will be present throughout the process;
  - the low temperature range at which dioxins and furans are formed and the residence time at which dioxin precursors are exposed to these conditions;
  - *de novo* synthesis of dioxins; and
  - the role of certain metals which serve as catalysts for dioxin formation.
- An estimate of projected dioxin/furan production throughout the process, including estimates of how much would be released through each products or waste stream. Data should be provided in I-TEQs as well as total mass.

Dioxins are the most toxic class of chemicals known to science and much research has been done on them. Since halogens and metal catalysts are part of the feedstock for this refinery and since the temperatures involved will pass through the dioxin formation range, it's critical that the EIS discuss potential for dioxin/furan formation.

41-41

30) Hazardous Air Pollutants Not Effectively Monitored

Page 4-9 states:

"Air Quality Program Permit No. 54-399-034, issued by the Pennsylvania Department of Environmental Protection for the proposed facilities, establishes maximum allowable limits for total facility emissions of less than 10 tons for any single hazardous air pollutant (e.g., mercury) and less than 25 tons altogether for any combination of hazardous air pollutants during any consecutive 12-month rolling period. The permitted limits function as a cap to ensure that the proposed facilities would be a minor new source of hazardous air pollutants under the National Emissions Standards for Hazardous Air Pollutants regulations."

10 tons of annual emissions of hazardous chemicals such as benzene is a very significant impact. The EIS should describe some of the health implications of such large exposures to hazardous chemicals.

41-42

The EIS should also drop any pretense of the permit limits functioning as a "cap to ensure" anything. Permit limits cannot be enforced if there is no required monitoring. The permit contains no requirements for stack testing of HAPs. Not continuously. Not monthly. Not even annually.

41-43

The only testing for HAPs required in the air permit is a quarterly test for petroleum liquids in the facility, which will be used to *estimate* the air emissions. However, this cannot accurately portray the emissions once such liquids are burned and chemical constituents change in the combustion process.

The permit states, on page 43: *"To ensure the practical enforceability of the annual Hazardous Air Pollutant (HAP) emissions limit, the permittee shall, on a quarterly basis, perform tests of all petroleum liquids being stored and distributed at the facility in order to determine the HAP content of each."*

41-44

As weak as that is, it gets worse. The permit allows them to stop even the quarterly testing if they can document the HAP content of the liquids "provided by the manufacturer." It states: *"The quarterly testing of a petroleum*

41-45

liquid may be waived if the HAP content of the liquid can be demonstrated from documentation provided by the manufacturer (i.e. Material Safety and Data Sheets, manufacturer testing results, etc.).”

Isn’t the “manufacturer” the refinery operator? In order words, the company can decide, on their own, to make up Material Safety and Data Sheets from test results on their manufactured liquids, then stop testing altogether? 41-45

The EIS ought to be honest and state that unless they do actual stack testing (preferably with continuous emissions monitoring devices that are now available for many HAPs), they just won’t know if they’re in compliance with the “caps” in the air permit. 41-46

31) Six Smokestacks Need More Explanation

Page 2-15 briefly describes the six smokestacks, but is very vague about what processes they’re connected to and what would come out of each stack. The EIS should explain whether all of them involve combustion units. It should explain why one stack is 100 feet taller than the others. It should also explain the chemical composition of the materials being sent to each stack (pre- and post-combustion, if combustion is involved)? It should explain which, if any, will have pollution control devices. The throughput for each stack should be included. Finally, will the facility have any flares that are not enclosed in a stack? 41-47

32) Non-Attainment Designations Unfounded

The PM-10 and PM-2.5 attainment designations for Schuylkill County aren’t appropriate for evaluating local air emissions impacts, as they’re based on an air monitor 35 miles away in a different county, in a different airshed, on the other side of three mountains. The Reading, PA air monitor is also not surrounded by or directly downwind of fossil fuel or wood burning power plants. The Gilberton area is immediately surrounded by three waste coal power plants and is downwind of two additional waste coal power plants, two conventional coal power plants and a wood burning power plant. Any discussion of ambient air pollution, “attainment” and cumulative air impacts must take this into consideration and cannot rely on official “attainment” designations relying on air monitors in irrelevant locations. 41-48

33) Air Impacts of IGCC Alternative Not Discussed

Section 5 discusses the possibility of an unsuccessful demonstration being followed by conversion of the facility to an integrated gasification combined cycle (IGCC) power plant. The EIS fails to mention that this would involve a substantive increase in local air pollution, as the gases that would normally be turned into liquids and burned in vehicles throughout the multi-state region would instead be burned all in one place, increasing the load of pollutants emitted in Schuylkill County. 41-49

34) Arsenic and Mercury Air Emissions Estimates Not Disclosed

WMPI’s consultants prepared a spreadsheet estimating the refinery’s arsenic and mercury air emissions. It concluded that 2.4 pounds of arsenic and 38.6 pounds of mercury would be released into the air each year. It used standard EPA models that may not be representative of the combination of fuels and technologies proposed for the refinery. Nevertheless, the EIS ought to make these estimates available if not come up with a more accurate estimate of these HAP emissions as part of a broader analysis of emissions and mass balance of metals and other contaminants of concern. The WMPI spreadsheet, which had been made available to PA DEP, can be found here: http://www.ultradirtyfuels.com/AsHgEmissions.xls 41-50

35) CO2 Emissions Downplayed, Yet are Worse than Petroleum Diesel or Coal with Sequestration

Without CO2 capture and sequestration, CO2 emissions from producing and consuming a gallon of diesel from coal would result in 1.8 times as much CO2 as a gallon of diesel from petroleum. Even with CO2 capture and sequestration (which isn't planned for the WMPI refinery), Fischer-Tropsch diesel would emit 1.1 times as much CO2 over its lifecycle as diesel from petroleum.[10]

The DEIS comments on global climate change attempt to minimize the global warming emissions by comparing to global emissions. With this sort of comparison, *any* single facility would look like an insignificant contributor. Would one make the same comparison for mercury or other toxic emissions? This is a really inappropriate way of viewing pollution and only serves a public relations purpose, not a defensible scientific purpose. Since Pennsylvania is already responsible for about 1% of global greenhouse gas emissions and since the global emissions are already excessive and causing irreversible climate disruption, no added amount of greenhouse gas emissions is justifiable. Making things worse, the 1% figure doesn't include mine fires and Pennsylvania is responsible for about 94% of mine fires in the U.S. It also doesn't account for the fact that three large new waste coal burning power plants were permitted in the past year… each of which would use fluidized bed boilers, which are known to convert nitrogen into nitrous oxide (a greenhouse gas), resulting in a net 15% increase in greenhouse gas emissions over traditional coal-fired boilers. This refinery is adding insult to injury in the global warming department and no means of minimizing or downplaying the numbers can change that fact. 41-51

ALTERNATIVES

36) Alternative Technologies Not Evaluated

DOE has refused to evaluate alternative technologies, arguing that the EIS only needs to evaluate the "no action" alternative. By defining the purpose of the funding very narrowly ("demonstrate the production of electricity, steam, and liquid fuels from coal waste by integrating coal gasification and F-T synthesis of liquid hydrocarbon fuels"), it forgoes any true look at alternatives. There are environmentally-preferable alternatives for all objectives that could be met by this proposed refinery. By mandating that all objectives must be met through a single project, rather than an alternative that could include a combination of projects, the DEIS violates the spirit, if not the letter, of NEPA. 41-52

37) Alternative Sites Not Evaluated

WMPI, other developers and even governors are already discussing alternative sites in Alaska, Colorado, Illinois, Indiana, Kentucky, Montana, Ohio, southwestern Pennsylvania, Virginia, West Virginia and Wyoming. Most of these sites would even make more sense, given that a commercial-scale F-T coal-to-diesel facility would not be able to run on anthracite waste coal (due to geographic and resource limitations), but on bituminous coal or some other variety of coals not found in eastern Pennsylvania. The EIS needs to properly evaluate alternative sites. 41-53

NOISE

38) Hearing Ability of Wildlife

Page 4-19 states: "No long-term impacts on the hearing ability of wildlife species would be expected from construction-generated noise."

Please provide citations for this statement. If you can't document it, don't put such definitive statements in print. Please don't simply make up information. It makes you look bad and damages the credibility of your writings. 41-54

[10] Marano, John J, and Ciferno, Jared P, Life-Cycle Greenhouse-Gas Emissions Inventory For Fischer-Tropsch Fuels, prepared for U.S. Department of Energy National Energy Technology Laboratory, June 2001.

39) Noise Measurement

Noise should be measured from the loudest equipment that could be on the edge of the refinery property, closest to the prison and calculated for the distance to the closest residential section of the prison or the closest place where prison workers would spend a significant amount of time. 41-55

FORESTS AND LAND RECLAMATION

40) Forests

Pages 4-19 and 4-20 state that *"approximately 1,000 acres would be reclaimed over the entire 26-year operating life of the proposed facilities. Over the long term, the terrestrial habitat created on reclaimed lands would offset the 76.5 acres of deciduous forest that would be cleared for the proposed facilities."*

It's good to see evaluations over the 26-year operating life. The EIS ought to be consistent and evaluate ALL impacts over the life of the refinery, not just those which help the EIS make the project look favorable. 41-56.1

Since many waste coal piles are currently covered to some degree with vegetation, this evaluation must consider the trees and other plant life that would be cleared to access these piles. 41-56.2 It also ought to consider the fact that the enormous amount of solid waste would be dumped throughout the region, possibly returning to the same waste coal pile sites that are supposedly being "cleaned up." Waste coal slag doesn't make for good land reclamation and probably won't be a very good replacement for deciduous forest. 41-56.3

TRANSPORTATION

41) Average Workers Per Vehicle

Page 4-26 states the assumption that construction workers would average two per vehicle. This seems pretty high for temporary construction work trips. Please document that this is a reliable average for this type of work and the geographic region in question. 41-57

42) Rail Shipping

Pages 2-8 and 2-9 describe rail shipping and state that "special permits and advanced planning would be required." However, the necessary permits aren't listed in Section 7, where permit requirements are addressed. The EIS should address this. 41-58

43) Red Ash Comment Misunderstood in DEIS

Page 4-12 states: *"a concern was expressed regarding airborne emissions resulting from vehicles traveling over red anti-skid material applied to roads (Section 1.5). This material is bottom ash from the existing Gilberton Power Plant, which is applied to alleviate treacherous road conditions during the winter. Because the bottom ash from the proposed facilities would be in the form of a glass-like slag, which is not suitable as an anti-skid material and would not be applied to the roads, this concern would not become an issue."* 41-59

This is a concern for many in the community, but was misunderstood by the author of the DEIS. The concern isn't that slag from the proposed refinery would be used as anti-skid material, but that the additional traffic would

exacerbate an existing problem whereby the Gilberton power plant ash (when used as anti-skid material) is pulverized by vehicles, creating a toxic dust that contributes to local respiratory and other health problems. 41-59

PERMITS

44) Two State Permits Missing

In addition to the rail shipping permit mentioned above, Section 7 is missing two permits that WMPI is currently seeking from PA DEP. These are the Water Quality Management Part II Permit and the Storage Tank Site Specific Installation Permit. 41-60

ENVIRONMENTAL JUSTICE

45) Impacts on Prison Population

The DEIS makes several claims that the impacts of the proposed refinery won't effect the prison population adjacent to the property where the facility hopes to locate. Page 4-26 states that "the Mahanoy State Correctional Institution is a sealed facility in which inmates and employees would not be exposed to outside air except during periods of outdoor activity." The facility is not "sealed." Like any other commercial business, they have ventilation systems that bring in outdoor air in the course of circulating air throughout the buildings. They have 25% outdoor air coming in all the time, even in winter. No special air filters are installed to handle the sorts of pollutants that the refinery would release next to the prison. Also, the prison is made up of many buildings and prisoners and prison workers regularly must walk outside to get between buildings throughout the day. There is no air filtration system or closed air system that protects prisoners and prison workers from refinery emissions. 41-61

Clearly, the impacts of the refinery will be disproportionately felt by the predominantly black and Hispanic prisoner population. This is a violation of Executive Order 12898 of February 11, 1994, requiring "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations." It is also a violation of the Civil Rights Act of 1964, which prohibits federal funds for being used for actions that have a discriminatory effect on racial minorities.

LABOR

46) Risk Studies Not Done

The DEIS relies on risk studies that would be done in the future. Page 4-34 mentions a Hazard and Operability review or Process Hazards Analysis and a Risk Management Plan, yet these studies haven't been done. Given the experimental nature of this facility, we can assume that accident risks will be somewhat higher than usual for refineries. The EIS ought not be finalized until these studies have been done, so that the true environmental impacts can be included in the final EIS. 41-62

47) Accident Risks Downplayed

Page 4-34 mentions ConocoPhillips reports that provide probabilities for catastrophic failures. However, the EIS doesn't mention the types of failures and accidents that are quite common and not without significant impacts on worker safety, environmental health and human health. Refineries face accidents pretty routinely – far more frequently than the "catastrophic failure" rates mentioned in the DEIS. These routine accidents should be quantified and references in the EIS. 41-63

CUMULATIVE IMPACTS

48) Fails to Look at Future Expansion

An April 2005 press release from WMPI states: "With the completion of the Gilberton Coal-to-Clean Fuels and Power Plant financing and following the successful start-up and operation of this facility, larger-scale commercial plants (10-12 fold increase in output size) are likely to be constructed." (http://www.ultracleanfuels.com/articles/wmpi_041805.htm)

John Rich was quoted in the Charleston Gazette on 9/18/2005: "Eventually, Rich said, he sees the plant building out its capacity, requiring a $4.2 billion investment." (http://www.ultracleanfuels.com/articles/cgazette_091805.htm)

Since Rich foresees expanding this proposed refinery to a size far larger than currently proposed, the cumulative impacts section ought to look at the impacts of future expansion of the refinery.

41-64

49) Fails to Look at Cumulative Air Impacts

Because DEP set the permit limits just a hair below the "significant impact levels," the DEIS argues on page 6-1 that "because the analysis indicated that maximum predicted concentrations would be less than the significant impact levels, the proposed facilities would not contribute to cumulative air quality impacts."

This is ridiculous. Just because a permit limit for a single facility was set just below a regulatory limit that would require air modeling, there is no justification for assuming that a facility would not contribute to cumulative air quality impacts. With the twisted logic in the DEIS, one could site 100 facilities next to one another, each with permit limits of 99.9 tons/year for most regulated pollutants and argue that there is no cumulative impact, since each individual facility is under a regulatory limit.

In the reality of Schuylkill County air quality, there are five waste coal burning power plants in the county, three others in neighboring counties and three more pollution-spewing power plants (two coal and one wood) sending their pollution towards the county. There are numerous other air pollution sources as well. The refinery would add to the cumulative air pollution impacts. The EIS needs to look at this honestly and not use twisted logic to dodge this evaluation.

41-65

50) Lifetime of Waste Coal Power Plants Likely to be Shorter than 26 Years

Pages 6-1 and 6-2 state that the temporal time frame for the cumulative impacts analysis would be equal to the 26-year lifetime of the refinery. Due to their high cost, small economy of scale, expiring power purchase agreements and diminishing supplies of economically recoverable waste coal within this time frame, the waste coal burning power plants in the region shouldn't be expected to last 26 years. The analysis should evaluate a realistic lifetime for these plants when evaluating the cumulative impacts and the amount of remaining waste coal to feed the refinery.

41-66

Ewall, Mike (41)

Comment 41-1

The scope of EIS is often limited to the construction period and the 3-year demonstration period, without addressing the impacts of the long-term (26+ year) operational life of the refinery. These facility lifetime impacts would be a direct consequence of DOE's decision to fund the project, since the DEIS argues that this funding is necessary to make it possible for the demonstration plant to operate in the first place.

Response:

Chapter 5 discusses the impacts of operations beyond the demonstration period. The duration of the analysis has been extended from 26 years to 50 years.

Comment 41-2

"The DEIS states that the decision is whether to fund the project with "$100 million (about 16% of the total cost of approximately $612 million)" [xvii]. The projected total cost of the refinery jumped from $300-312 million to $612 million in the year that WMPI applied to DOE for this funding. This issue was raised in the scoping comments but went unaddressed in the DEIS.

No explanation has been given for this near-doubling of project costs and it seems that this increase ought to be properly justified so that DOE can assure that no fraud is perpetrated on federal taxpayers and so that the project can be properly evaluated with regard to the 75% cut-off for repayment. The DEIS doesn't mention this 75% cut-off and ought to be clear about how this cut-off affects the applicant's obligation for repayment.

The following chart is based on the stated costs of the refinery in over 30 news articles since 1998. Citations of articles for each data point are available online at: http://www.ultradirtyfuels.com/projectcost.html"

Response:

Revised Section 1.3 notes that DOE's share of the funding for the 3-year demonstration project is expected to be approximately $100 million, or 10% of the total cost of $1 billion. Private sector financing and transferable tax credits would provide the remainder of the funds. DOE conducts a thorough analysis of proposed project costs prior to award of a cooperative agreement. WMPI PTY, LLC will be required to provide sufficient evidence that project financing is likely to be available for the entire project and that projected revenues from the facility are achievable and can meet project expenses and debt service requirements. Once awarded, only costs that are allowable under the applicable federal cost principles may be invoiced and shared by DOE.

Comment 41-3

"The DEIS states on p 4-24 that "because the proposed facilities would be located between an existing power plant and a correctional institution, project construction and operations would not likely decrease residential property values in the county."

No citations are provided to back up this spurious claim. Have real estate agents been consulted? Have any studies of property values relating to industrial facilities been reviewed?

The claim contradicts itself, since it implicitly admits that power plants and prisons have a negative effect on property values. However, the assumption is that property values are already so impacted that they couldn't possibly go any lower – even if a refinery is built that impacts the community with air pollution, noise, traffic, water withdrawal and waste disposal.

It also talks about impacting property values "in the county." Has any county-wide study of property values been done, or is the author just making this up? What about the impacts on property values in Morea, Mahanoy City, Frackville, Gilberton and Shenandoah?"

Response:

The statement in EIS Section 4.1.7.3 that "because the proposed facilities would be located between an existing power plant and a correctional institution, project construction and operations would not likely decrease residential property values in the county" is not based on local studies or surveys. The statement was based on an over-simplified assumption about how local property values would respond to the proposed project, and has been removed from the EIS. There are, in fact, so many local, regional, and national factors that affect property values that it is difficult for a local survey or study to attribute decreases to a single factor. Similarly, statements referring to "studies of property values relating to industrial facilities" have also been deleted.

Comment 41-4.1

"The sections on "Social and Economic Resources" (xxiii, 3.7 and 4.1.7) fail to quantify the impacts of numerous public subsidies in offsetting the "positive effects on employment and income" that "would contribute to the regional economy" (xxiii).

In addition to the $100 million subsidy that this EIS process would lead to, the EIS needs to consider the total public subsidy from:

• $7.8 million from the U.S. Department of Energy's Clean Coal Power Initiative (already awarded) for engineering studies done under Cooperative Agreement DE-FC26-00NT40693 (http://www.netl.doe.gov/technologies/coalpower/gasification/projects/systems/co-prod/cp40693.html)

• $47 million in tax credits from the Commonwealth of Pennsylvania

• $465 million in loan guarantees from the Commonwealth of Pennsylvania (which also ought to be mentioned on page 1-3, where it states that "private sector financing would provide about $465 million")

• An agreement where the state and its trucking association will purchase nearly all of the refinery's product at $1.30/gallon (30 cents more than their cost of production)"

Response:

DOE has evaluated the environmental impacts of the proposed action, including the socioeconomic impacts. Additional financial incentives would have no cumulative socioeconomic impacts.

We note that, to the best of DOE's knowledge, the Commonwealth of Pennsylvania has not authorized $465 million in loan guarantees for the project. DOE believes that references in the press to State loan guarantees were a mistake.

Comment 41-4.2

"In addition to the $100 million subsidy that this EIS process would lead to, the EIS needs to consider the total public subsidy from:

• Exemption from all state and local taxes through 2013 through the Keystone Opportunity Expansion Zone program

• Increased stress on local police protection, fire protection, emergency medical services, schools and health care.

• Increased obligation on Pennsylvania's Department of Transportation to address the pending traffic congestion that the DEIS admits "would be particularly acute.""

Response:

EIS Section 4.1.7.6 acknowledges that the proposed facilities would be located in one of Pennsylvania's designated Keystone Opportunity Zones and that local real estate taxes for the proposed project site and taxable improvements would not be due until 10 years after project construction is complete (see responses to comments S1-1 and S11-1. EIS Section 4.1.7.5 addresses potential impacts to police protection, fire protection, emergency medical services, schools, and health care. EIS Section 4.1.7.8 acknowledges that increased traffic associated with project construction and operations would likely cause traffic congestion and have an appreciable impact on traffic flow and safety, and that the Pennsylvania Department of Transportation would need to be involved in mitigating these impacts (see response to comment 33-12).

Comment 41-5

"The DEIS assumes that the slag, fine solids and sludges produced by the refinery would all test non-hazardous, therefore not requiring expensive disposal options. The EIS ought to consider the economic consequences of a determination that the slag, fine solids and/or sludges would be considered hazardous waste. If such a determination were made, where would these wastes go for disposal? How much would their disposal cost?"

Response:

Based on available information on the processes that would be implemented in the proposed facilities, the slag, fine solids, and sludges are very unlikely to be RCRA hazardous wastes. If any residues from the proposed facilities were found to be RCRA hazardous waste, they could be handled by a commercial hazardous waste contractor, which would ship them to commercial treatment or disposal facilities with appropriate technical capabilities and regulatory permits. The potential costs of hazardous waste disposal and the potential economic implications for WMPI are not within the scope of NEPA review. Also see the response to comment 31-32.

Comment 41-6

"Page 1-2 describes the 20-year loan repayment period, but leaves out other important details of the loan process. Must the loans be repaid with interest? If so, at what interest rate? Under what conditions would WMPI be permitted not to repay the loan? How would this be impacted by any forgiving of the repayment requirement if WMPI is determined to be providing at least 75% cost sharing?"

Response:

The details of the financial assistance to be provided to WMPI as part of the proposed action had not been finalized at the time this document was prepared, and therefore, the information is not available.

Comment 41-7

"Page 2-19 states: "Without DOE participation, the proposed project would be canceled due to insufficient funding and may not be demonstrated elsewhere."

This statement is unfounded and is contradicted by the following:

• $512 million of the alleged $612 million cost of the project is already covered by tax credits of loan guarantees by the Commonwealth of Pennsylvania. The fact that the Commonwealth of Pennsylvania chose to offer $465 million in loan guarantees is no accident. It's the exact remainder of what they needed to cover the full $612 price tag: $612 million – ($100 from DOE + $47 in tax credits) = $465 million. If the $100 wasn't forthcoming and if private investors weren't willing to take that risk, it's realistic to assume that the Commonwealth of Pennsylvania would cover that remainder, given their heavy commitment to the project.

• According to several news articles available on the UltraCleanFuels.com website, commercial-scale projects are already being considered in Alaska, Colorado, Illinois, Indiana, Kentucky, Montana, Ohio, southwestern Pennsylvania, Virginia, West Virginia and Wyoming. Competing economic interests as well as governors in some of these states are already promoting these projects and it's likely that, with ever-increasing petroleum prices, a full-scale refinery could be built without requiring the $100 million in funds for this demonstration project.

• The Mingo County Redevelopment Authority in Logan County, West Virginia is already doing a feasibility study on a full-scale refinery there. The Authority's director was quoted in the Charleston Gazette on 9/18/2005 stating that the "plant wouldn't hinge on government support" and that: "We don't like to look for the government to fund things for us," he said. "Someone has to be willing to take the risk and get egg on their face if it doesn't work out." (see http://www.ultracleanfuels.com/articles/cgazette_091805.htm for the full article)"

Response:

To the best of DOE's knowledge, without DOE participation, it is possible the proposed project would be canceled, and if it were, the proposed technology may not be demonstrated elsewhere.

Comment 41-8

"The characterization of beneficiated anthracite culm and petroleum coke (Table 2.1.3.) is woefully inadequate. Chlorine is listed, but the values are missing. Data on this is already available via EPA's 1999 ICR dataset (236.78 ppm chlorine in PA's anthracite waste coal and 356.71 ppm chlorine in petroleum coke burned in PA). This was based on an average of 993 and 97 available data points, respectively. Looking at Table 2.1.3., it seems that these figures are based on only one sample for beneficiated anthracite culm and two samples for petroleum coke. Reliance on so few data points is foolish and wouldn't get a passing grade in an undergraduate research project, especially when more complete data is available. EPA's

ICR data includes 56 data points specifically from Waste Management & Processors Inc., which would be the most accurate data, as it comes from the same beneficiation plant and same company that would be supplying the beneficiated waste coal. The average ash content in this data set (41.3%) is close to the figure in Table 2.1.3. (a convenient 40.0%, as required for use in Shell's gasifier). However, the btu/lb and sulfur numbers are more divergent. The btu/lb numbers reported by Waste Management & Processors Inc. to EPA in 1999 show 8,061 btu/lb – lower than the 8,340 listed in Table 2.1.3. Most significantly, the sulfur concentration (0.47%) is 58% higher than the 0.3% figure in Table 2.1.3. This represents a far higher amount of sulfur entering the process than what is assumed in the DEIS. The numbers for sulfur dioxide air emissions and elemental sulfur byproduct would need to be adjusted upward if the data that Waste Management & Processors Inc. reported to EPA is correct.

There is also no data in the DEIS on most other contaminants of concern in the fuel, including fluorine, bromine, mercury, arsenic, lead, cadmium, chromium and radioactive constituents. All of these and more were mentioned in my scoping comments, but were ignored in the DEIS. The comments named the aforementioned contaminants and asked that other elements which may pose a threat to human health or the environment be evaluated as well, including but not limited to any which would fall under the definition of "contaminant" or "pollutant" as defined by DOE's NEPA regulations, meaning "a substance identified within the definition of contaminant in section 101(33) of CERCLA (42 U.S.C. 9601.101(33))."""

Response:

DOE has revised Sections 2.1.2, 2.1.5.3, 4.1.2.2, and 5 of the EIS to include additional assessment of potential impacts from trace constituents of coal, including some of the constituents identified by the commenter. However, DOE does not have the information needed to develop a comprehensive mass balance for all coal constituents. Whether the sulfur content of the beneficiated anthracite culm is 0.3 percent or 0.47 percent, the Claus sulfur recovery unit would convert the sulfur compounds contained in the feedstock to elemental sulfur for sale as a byproduct (Section 2.1.6.3). Although petroleum coke has a high sulfur content, the expected effectiveness of the proposed facility's gas cleanup system would preclude significant alteration of air emissions. That is, if petroleum coke was used as part of a blended feedstock during commercial operation, air emissions would be expected to remain within the permitted levels for criteria pollutants and hazardous air pollutants identified in Section 4.1.2.2.

Comment 41-9

"The project's "Public Abstract" states:

"The Gilberton Coal-to-Power and Clean Fuels Plant will also test and use alternative feedstocks for economic operation. These would include other coals and/or coal wastes, petroleum coke, biomass, and selected industrial/municipal wastes." Source: http://www.netl.doe.gov/technologies/coalpower/cctc/ccpi/proposal-pdf/wmpiabs.pdf

Other documents relating to this DOE-funded project mention "other fuels" and "low-value resources" that would be processed by the refinery. One such document uses these terms and states that "process flexibility allows use of coal, coal wastes, petroleum coke, or biomass, alone or as blends" (see

http://www.netl.doe.gov/technologies/coalpower/cctc/pubs/Waste%20Management-WMPI-Gilberton-Rnd1Upd1.pdf).

In my scoping comments, I stated that the EIS ought to include the complete chemical composition of each feedstock that would be tested/utilized at the proposed facility. Only beneficiated anthracite waste coal and petroleum coke were covered (inadequately) in the DEIS.

Other coals, coal wastes, municipal, industrial and biomass wastes have different chemical compositions and pose very different environmental impacts that need to be analyzed. For example, poultry litter and wood waste can contain significant levels of arsenic (from arsenical drugs used in the poultry industry and from copper chromium arsenate wood treatment chemicals, respectively). Details on these specific issues can be found at http://www.energyjustice.net/fibrowatch/toxics.html and http://www.ccaresearch.org. These arsenic levels may exceed that found in anthracite waste coal and could lead to increases in arsenic contamination of air and waste streams. Similar – and not always well-known – chemical contamination issues exist for other waste streams and "biomass" fuels.

If the demonstration project would be test-processing feedstocks other than anthracite waste coal, the EIS is deficient in failing to characterize them."

Response:

A comparison of the potential impacts of the use of anthracite culm and a blended feedstock containing culm and up to 25% petroleum coke has been incorporated into Appendix G and Section 4. WMPI has notified DOE that no feedstocks other than anthracite culm and possibly petroleum coke would be processed during the demonstration period. Further, DOE is not aware of any proposal to utilize alternative feedstocks after the demonstration period. Accordingly, the EIS does not analyze impacts of processing the alternative feedstocks identified by the commenter.

Comment 41-10

"My scoping comments included a request for a mass balance, as follows:

The ultimate disposition of the above elements, providing a mass balance for each element, so that there's no illusion about mercury, chlorine or other contaminants going in, but not coming out somewhere. Include information on how much of each element will be released through each product or waste stream (i.e. the "ultra clean" fuel, the slag, the stack emissions, etc.) and in what form (how much sulfur would be released as H2S, H2SO4, or in some other form?; how much chlorine would be released as HCl, dioxins, furans or otherwise?).

Without knowing this, it's impossible to evaluate the environmental impact of toxic metals, sulfur, halogenated compounds and radioactive contaminants. It's important to know the levels of such contaminants and the degree to which they'd be present in air and water emissions, solid wastes and fuel products produced at the refinery. Since this can vary depending on the waste/fuel stream, it ought to be performed for each feedstock that the refinery plans to use.

Using EPA's ICR data for the mercury content of anthracite waste coal, it can be determined that about 550 pounds of mercury will enter the refinery each year through the fuel. All of this mercury must come out somewhere. For mercury and the other contaminants mentioned above, the EIS should be clear about where all of it ends up."

Response:

DOE has revised the EIS to include additional assessment of potential impacts from mercury and other trace constituents of coal (See Section 4.1.2.2). Note, however, that DOE does not have the information needed to develop a comprehensive mass balance. Regarding dioxins and furans, these chemicals would not be generated (see the response to comment 41-41).

Comment 41-11

"In my scoping comments, I specifically asked that the EIS address whether cement kiln dust (CKD) could or would be used as a limestone source. If it would be, the EIS must evaluate the environmental hazards associated with using such a toxic waste stream, specifying whether CKD from kilns burning tires or hazardous waste would be used and how that affects contamination rates. EPA has identified far higher levels of dioxin in CKD from kilns burning hazardous waste. There are more kilns in Pennsylvania than any other state and some kilns in eastern Pennsylvania are already burning hazardous waste or tires."

Response:

WMPI would not use cement kiln dust as a limestone source.

Comment 41-12

"Since limestone constituents (such as magnesium) can affect the leaching of metals (especially lead) from slag and ash, the EIS ought to include the chemical composition of the limestone that would be used in the refinery, with particular attention to elements than can affect leaching."

Response:

WMPI has not identified a proposed limestone source for the proposed facilities. Because Pennsylvania has abundant resources of very high-purity limestone (Barnes and Smith 2001), it is reasonable to expect that WMPI would obtain limestone that is very low in trace metals and other constituents that could adversely affect facility performance and contribute to adverse environmental impacts. To ensure that limestones with high concentrations of lead and other impurities would not add unnecessarily to environmental impacts, the Pennsylvania Department of Environmental Protection could make environmental permits for the proposed facilities conditional on use of limestone meeting strict specifications for purity. Note: The presence of magnesium would not substantially affect the leaching of metals from slag and ash.

Comment 41-13

"The Shell gasification technology has the flexibility to gasify anthracite culm with an ash content of up to 40%. According to EPA's ICR data, Schuylkill County culm has an average ash content of 52%. This pre-beneficiation ash content isn't mentioned in the DEIS, but ought to be. Of the five waste coal burning power plants in the county, Rich's Gilberton power plant has best average ash content at 41.3% (as a result of the beneficiation plant). However, this fluctuates to as high as 48%. [Thirty-nine] 39 of 56 samples are over 40%. All samples at the nearby St. Nicholas waste coal burning power plant are over 40%, ranging from 58.7% to 72.4% and averaging 66.5%. Clearly, the beneficiation process has a lot of

work to do to ensure a consistent feedstock that doesn't exceed 40% ash. The beneficiation plant will need to produce a large volume and tonnage of waste (mostly rock) in the process of producing a reliable feedstock for the refinery. Since the beneficiation process is so integral to the refinery project, its impacts ought to be better examined.

The following questions should be answered in the EIS:

- What is the amount of unprocessed (pre-beneficiation) waste coal (in volume and tonnage) that would be needed per day (and per year)?
- What volume and tonnage of waste product would be produced in the beneficiation process per day and per year?
- Where will this waste end up?
- How much dust will be created in the beneficiation process? How would this affect people in nearby Gilberton?
- Of the 386 gal/min of mine pool water used in the beneficiation process (2-13), how much ends up in wastewater?
- It the amount and source of water use for beneficiation included in the water withdrawal permit from the Susquehanna River Basin Commission?
- What is the chemical composition of the waste water produced by the beneficiation process?
- Where would this waste water end up?"

Response:

The EIS has been revised to include additional information on project water use, beneficiation wastes, and the potential environmental impacts from the coal beneficiation that would occur as a result of the proposed project. See Sections 4.1.4.1 and 4.8.2.

Comment 41-14

Page 2-2 states that "the primary feedstock would be low-cost anthracite culm, ..."

Response:

Additional information and analysis on culm resources and potential availability is presented in Sections 3.3.3, 4.3, and 5. This analysis indicates that culm resources would last for at least 15 years of operation. Continued commercial operation after that time could require the use of other fuels, but DOE does not have information on the other fuels that might be used after culm is exhausted.

Comment 41-15 and 41-16

"Page 4-13 states: "The facilities' use of water from the Gilberton mine pool would lower the average water level in the mine pool, and thus reduce roof support in the abandoned mine workings below Gilberton. However, this would not be expected to increase the likelihood of collapse. Water levels would remain within their current range…."

These statements are contradictory. First, they admit that mine pool levels would drop and reduce roof support, then they pretend that this wouldn't increase likelihood of collapse."

"The EIS ought to discuss the fact that water would be returned (via the tailings pond) to a different (but connected) mine pool. The Susquehanna River Basin Commission, in its water withdrawal permit for the WMPI refinery, states the possibility that the water withdrawal could lower the water level significantly enough that WMPI may need to seek

additional permits to withdraw water from other locations. It also states that the mine pools may not be as connected as some believe.

The permit states:

"Long-term hydrographs of the few available boreholes in some of the mine pools confirm that barrier pillars between the various mine pools have not all been breached or so severely compromised so as to allow free flows of groundwater among the mine pools." (p2)

"If the pumping water level in the Gilberton Mine Shaft reaches 1,087 feet AMSL, the project sponsor shall submit its projections and evaluation of anticipated additional drawdown. Should the evaluation show that the water level will decline below 1,084 feet AMSL, the project sponsor shall submit the appropriate application(s) for supplemental withdrawal locations." (p8)"

Response:

Sections 3.4.3, 4.1.3.3 and 4.1.4.1 have been revised as a result of these and other comments. Revisions include correction of previous misidentification of the mine pool to which effluents would be discharged, new discussion about the Susquehanna River Basin Commission permit and the possibility that pumping could lower the mine-pool water table to below the elevation range in which it is currently maintained, and expanded discussion of the potential for increased subsidence and structural damage on lands above the mine pool. Also see the responses to comments P11-4 and P11-5.

Comment 41-17

"Table 3.4.2. provides a chemical analysis of Gilberton mine pool water, but fails to include lead levels, which are now known to be quite excessive (check PA DEP's own groundwater monitoring reports). A chemical analysis should be provided for various depths within the mine pool and – based on the trace elements that are concentrated in and that have leached out of waste coals – should include aluminum, antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium and zinc. Major parameters should also include tests for acidity and alkalinity."

Response:

Sections 3.4 and 4.1.4 have been revised to present additional information about mine pool water quality and additional assessment of the potential for environmental impacts from lead and metals in the mine pool water.

Comment 41-18

"Page 4-16 states: "Toxic and carcinogenic substances, including cyanides and polycyclic aromatic hydrocarbons (PAHs) such as pyrene, might be present in low concentrations (SAIC 2002)."

Toxic and carcinogenic substances – particularly metals – accumulate in the environment and are often toxic at "low concentrations." Dismissing their impacts by stating that they're in "low" concentrations and claiming that their impacts won't be noticed because the impacts of acid mine drainage are more noticeable is irresponsible and is bad science. Please explain what "low concentrations" means in terms of the ability of these substances to cause health effects in those exposed. Do so using the current scientific knowledge, not government standards that have been set years ago based on a combination of politics and earlier scientific understanding of health effects. Also, the EIS ought to differentiate those which are

persistent and bioaccumulative toxins (PBTs) from those which would readily and naturally degrade. PBTs ought to be evaluated in terms of what the levels would be after a 26-year project lifetime."

Response:
See the response to comment S10-5.

Comment 41-19
"1,867 gallons of wastewater would be dumped in the tailings pond every minute (p2-13). Even if the contamination levels in this waste water are "low," this represents a significant amount of toxic discharges over time. Figures ought to be provided for the chemical composition of the waste water discharges. This data already has been filed with PA DEP on 2/18/2005 in their Water Quality Management Part II Permit Application."

Response:
The EIS has been revised to include and analyze information contained in permit applications that WMPI submitted to the Pennsylvania Department of Environmental Protection (See Section 4.1.4.1). Note that the Water Quality Management Part II Permit Application filed on February 18, 2005 did not provide water quality data for all facility wastewater streams or for the treated effluent.

Comment 41-20
"The DEIS provided no baseline analysis of existing contamination in the tailings pond and soils. The EIS ought to establish the current loading of metals and other toxic substances in the tailings pond as well as estimates of the expected increases over the 26 year projected lifetime of the facility. Borings done on the tailings pond should evaluate both by leach test and by total content of each contaminant present in the soils."

Response:
DOE has not sampled the sediment in the tailings pond. Because the principal source of sediment in the pond is indicated to be settled suspended solids discharged from the beneficiation plant, sediments are assumed to consist of fine-grained natural geologic materials (soil, coal fines, and rock dust) with chemical composition similar to that of the geologic materials found in the underlying mine pools.

Comment 41-21
"The following sections of the DEIS allude to the fact that contaminants would be transferred to the tailings pond and these sections ought to be made clear about this fact. The baseline testing and project lifetime contamination estimates for the tailings pond ought to include all contaminants mentioned in 4-16 and 4-33 as well as a panel of all relevant metals (at least those discussed in comment #16 above).
2-16: *"**Suspended solids** included in the effluent would be trapped within the tailings pond and would not percolate to the mine pool."*
2-21: *"Discharge of treated effluent to the mine pool by seepage from the tailings pond would be expected to improve mine pool water quality by reducing concentrations of **acidity and dissolved metals**."*

4-16: *"Although the facilities' wastewater treatment system would be designed to treat organic residues (Section 2.1.6.2), effluents from the facilities could contain residual amounts of* ***organic compounds*** *found in process wastewaters.* ***Toxic and carcinogenic substances, including cyanides and polycyclic aromatic hydrocarbons (PAHs) such as pyrene****, might be present in low concentrations (SAIC 2002)."*

4-33: *"Operation of the proposed facilities would generate several different liquid wastes requiring treatment or control. Liquid wastes from the gasification and liquefaction processes would hold* ***various impurities*** *collected in processing, offgas cleaning, and solid waste processing. Process wastewaters would have* ***high organic loadings*** *and would require treatment for substances including* ***methanol and other alcohols, formates, ammonia, formic and acetic acids, cyanides, sulfides, and chlorides****. Stormwater runoff collected from the facilities, coal piles, and other areas would require removal of* ***oil and grease*** *and other contaminants. Wastewater from demineralization of mine pool makeup water would have high concentrations in dissolved substances removed from the mine pool. Contaminants in wastewater released from the cooling water system would include* ***proprietary biocides, corrosion and scale inhibitors (such as phosphates), chlorine, and other substances injected into the makeup and circulating streams to inhibit corrosion and fouling, together with high concentrations of dissolved solids (such as sulfates) not removed during initial water treatment.****""*

Response:

See responses to comments 16-5, 25-7 and 30-6. Section 4.1.4.1, which discusses potential impacts of wastewater discharges from the proposed facilities, has been revised to include newly obtained information about facility effluents. In addition, cross-references have been added between that section and Section 4.1.8.2, which discusses liquid waste management for the proposed facilities.

Comment 41-22

"The DEIS may be dramatically underestimating solid waste production.

Page 2-7 states: *"The gasification facilities would… produce daily about 800 tons of coarse slag and 200 tons of fine solids on a dry basis."*

Page 4-29 states: *"Slag generated by the gasifier… would be generated at a rate of 1,600 tons per day (wet weight) or 800 tons per day (dry weight)."*

However, Appendix 1 (pA-6) in the Water Quality Management Part II Permit Application dated 2/16/2005 and received by PA DEP on 2/18/2005 states: *"The gasification plant also produces 2024 tons per day of slag (dry) and 164 tons per day of soot (dry)."* This is a 153% increase in tonnage of slag (dry measurement) over the numbers offered in the DEIS.

Also, the Storage Tank Site Specific Installation Permit Application (version 2), dated 1/14/2005 and received by PA DEP on 9/15/2005 states in the Emergency Response Plans, Appendix A, in a table titled "WASTE INVENTORY – Major Solid Waste Streams," that the gasification utilities will produce 133,800 lbs/hr of "drained course slag" and 41,900 lbs/hr of "fine slag filter cake." In a 24 hour day, this totals 1,606 tons per day of slag (possibly by dry measurement, given the term "drained") and 503 tons per day of fine slag filter cake.

These inconsistent numbers need to be corrected so that these two pending DEP applications match each other and the EIS. Once the proper figures are determined, the annual solid waste production figures in Table 2.1.1. would need to be revised."

Response:

The EIS has been revised to include updated information consistent with the permit applications cited by the commenter. Also see the response to comment S10-6.

Comment 41-23

"In media statements, the company has repeatedly described the slag as looking like "crushed brown glass."

Some of these statements can be found in news articles through the company's own website:

http://www.ultracleanfuels.com/html/a17.htm

http://www.ultracleanfuels.com/html/a18.htm

http://www.ultracleanfuels.com/html/a19.htm

http://www.whitehousechronicle.com/newsmaker/ed/ed_media03222002/ed_media03222002.ram

The DEIS (p4-29) describes the slag as "slag, which would be black in color and granular (sand-like) in form…."

Please resolve this color discrepancy."

Response:

The color of the slag is mentioned in the EIS to help readers understand what this waste stream would look like. The actual color of the slag may vary. The EIS statement that it would be black is consistent with the most recent information provided to DOE by WMPI (Robert Hoppe, WMPI, e-mail to Diane Madden and Janice Bell, DOE, April 24, 2006, quoting Mr. Ross Fava, Shell Global Solutions (US), April 21, 2006).

Comment 41-24

Various landfills in the region are specified by name and with township and county locations (3-29), but on pages 2-1 and 2-18, where it describes the dump sites for fine solids and sludges, it's not as specific, stating either "WMPI land" or that they'd "be trucked to the adjacent valley to the northeast for placement in a permitted ash disposal area on WMPI land." Please be specific in identifying the actual site name, landowner and permittee, as well as the township and county location. The landowner is probably not actually WMPI. The landowner for the refinery property isn't even WMPI, but another company related to John Rich: GCC Realty, Inc.

Response:

WMPI has not yet identified the specific locations where project waste would be placed on mined land. However, initially disposal is expected to be in Mahanoy Creek valley in the area that is permitted for coal refuse (i.e., culm) reprocessing, coal preparation, and disposal of coal ash and biosolids under coal surface mining permit 54850202, issued to B-D Mining Co. by the Pennsylvania Department of Environmental Protection. Listed owners of this and

other land where project waste might be placed include WMPI Land, GCC Realty, and B&D Mining.

Comment 41-25

Page xxvi in the summary states that the Toxicity Characteristic Leaching Procedure (TCLP) test would be used to determine hazardous waste designation for the facility's solid waste streams. Pages 4-30 and 4-31 discuss the Synthetic Precipitation Leaching Procedure (SPLP) and give the impression that the SPLP test might be used for the refinery's solid wastes. Please clarify which tests would be used.

Response:

DOE expects that both leaching tests would be performed on most facility solid wastes. Regulations require testing with the TCLP to determine whether wastes exhibit the toxicity characteristic of hazardous waste, as defined under RCRA. The TCLP is designed to evaluate waste leachability in a municipal solid waste landfill. However, the SPLP is more appropriate for determining leachability in a setting that does not contain municipal solid waste. SPLP results are likely to be used to comply with Pennsylvania Department of Environmental Protection residual waste regulations (25 Pa. Code Chapter 287; see Section 7.2), which require that applications for coproduct determinations (required for most beneficial uses of a residual material) must include results of leach testing using a procedure that is appropriate for the intended use of the proposed product. The SPLP also would be an appropriate choice for complying with other sections of the residual waste regulations that require leaching analysis. Also see the response to comment 41-26b.

Comment 41-26a

Laboratory leach tests aren't accurate indicators of real-life leaching of hazardous constituents from wastes. This is particularly true for lead, which has a U-shaped solubility curve and where mild acids are used in lab tests on waste products that include lime. These lab tests bring the alkaline pH back down to a neutral area where lead won't leach in the one-day tests, but in real life long-term exposure to changing pH, significant amounts of lead will leach out. This is described in Waste Not #317, March 1995, titled "The Great Incinerator Ash Scam Part 3." (http://www.workonwaste.org/wn317.htm or http://www.workonwaste.org/wn/317.pdf).

A report by the Electric Power Research Institute (cited below) shows that the results of field monitoring of gasification slags showed concentrations of iron, sulfur, manganese and other pollutants several orders of magnitude higher than occurred in parallel leach tests on the same waste.

EPA's Science Advisory Board is currently grappling with the limitations of laboratory leaching tests in predicting what industrial wastes like gasification slags will do in the disposal environment.

Laboratory leach tests like the SPLP in Table 4.1.2 which is used to okay dumping of coal ash and other residual wastes in coal mines in Pennsylvania with little safeguards, should never be considered reliable much less sole predictors of what coal ash or other residual wastes such as coal gasification slags will do in different disposal settings. The report *Long-Term Leaching Tests With Coal Gasification Slag* prepared for the Electric Power Research Institute by RADIAN CORPORATION (GS-6439, Research Project 2659-2, Final Report, July 1989) documents that concentrations of iron, manganese, sulfates and

other pollutants found in field monitoring wells at the bottom of cells containing gasification slags from plants of the type being proposed here, were in many instances, several orders of magnitude higher than concentrations of these pollutants in leachate from long-term leach tests done concurrently on the same slags. Concentrations of iron, manganese, sulfate, boron, chromium, silver and selenium at the bottom of the field cells and in surface waters draining the cells studied in this report were often several to many times over federal drinking water standards and corrective action standards used in most state residual landfill regulations. Given there are no isolation requirements, no corrective action standards and scant monitoring proposed for the slag wastes from this plant under permit 54850202, this EIS must present more substantive evidence to back its repeated assertion that this slag will not leach harmful levels of contaminants where its placed other than just saying that it will leach lower contaminant concentrations than the Gilberton coal ash, "due to the physical differences between slag and ash." This evidence should be based on actual field results, which are available in research, not postulated from benchmark laboratory leach tests.

The EPRI report shows that field monitoring results are higher than leach tests would indicate. Water in field tests (leachate in the bottom of a cell) had 810,000 ppb of iron, but the ASTM Extract (deionized water) test, which is similar to the SPLP test, showed only 9 ppb.

Since the political bodies are in the process of catching up with the science on this, it's realistic to assume that – over the lifetime of the proposed refinery – regulations will change that would require more accurate and realistic tests. Such tests would likely lead to a determination that gasification slags should be handled as hazardous waste. Given the significant economic implications – as well as the implications for how and where the slag would need to be brought for disposal – the EIS ought to examine this more thoroughly and not only through the lens of current laboratory leach test methods.

Response:

The EPRI-supported research study cited by the commenter (Thompson et al. 1989) was a long-term investigation of leaching of several coal gasification slags. All of the tested slags showed low leachability in short-term laboratory tests. All but one slag showed relatively low leachability in long-term testing under simulated field conditions. However, as the commenter notes, one of the tested slags released much higher concentrations of trace metals and other contaminants in the long-term field leaching test.

The slag that showed much higher than predicted leaching was produced from a coal with much higher sulfur content than would be used in the proposed facilities. Microbial oxidation of pyrite in the slag apparently occurred under saturated conditions in the test cell, stimulating the release of several contaminants. This combination of conditions would not be encountered in management of slag from the proposed facilities due to much lower concentrations of sulfur in the coal (and thus in the resulting slag), testing requirements of the Pennsylvania residual waste regulations intended to identify potential environmental problems in the proposed management of residual wastes, and the requirements in the residual waste regulations that prevent residuals from being disposed in settings where they could become saturated for extended periods of time (Section 7.2).

Comment 41-26b:

[The remainder of this section is borrowed from the working review draft of "Environmental Characteristics of Coal-Based Integrated Coal Gasification Combined Cycle (IGCC) Power Plants," prepared by Rui Afonso, Environmental Strategies, Inc.; Martha Keating, Keating Environmental Services; John Thompson and Joe Chaisson, Clean Air Task Force.]

A primary environmental concern is that toxic substances could leach out of slag. The test that is used to determine RCRA applicability for toxicity is the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP is the EPA test method used to evaluate the leachability of metals, organic compounds and pesticides from wastes into groundwater. The TCLP is a batch test developed by EPA in response to deficiencies in an earlier test, the Extraction Procedure (EP). Many of the assumptions used in developing the EP were retained, however, and the TCLP is also widely considered to have serious limitations. In principle, the TCLP simulates the leaching of constituents from the waste into groundwater under conditions found in a municipal solid waste landfill.

However, the TCLP has been widely criticized when it has been applied to wastes other than municipal solid waste and in disposal settings other than municipal waste co-disposal.

The EPA's Science Advisory Board has criticized the TCLP protocol on the basis of several technical considerations, including the test's consideration of leaching kinetics, liquid-to-solid ratio, pH, potential for colloid formation, particle size reduction, aging, volatile losses, and co-mingling of the tested material with other wastes (i.e., co-disposal). Specific limitations of the TCLP are:

- TCLP underestimates leachate from some high alkaline wastes or environments.
- TCLP underestimates the leachate concentrations from oily wastes and paint wastes.
- TCLP does not account for waste disposed of in a monofill.
- TCLP may underestimate the chelation-facilitated mobility of some waste constituents.
- TCLP does not account for oxidation/reduction reactions occurring in landfills.
- TCLP may not predict the long-term mobility of organic constituents in some treated wastes.
- TCLP may not be appropriate for contaminated soil.
- TCLP does not predict releases to non-groundwater pathways.

Despite these limitations, the TCLP continues to be used to predict the leaching trends of different types of waste. It is also the test that most State governments routinely mandate in order to classify wastes as either hazardous or non-hazardous. This in turn determines how the wastes may be disposed of or reused. Other leaching methods are also available or are under development. These include the synthetic groundwater leaching procedure, the multiple extraction procedure, the synthetic acid precipitation leach test and the California waste extraction test. The U.S. EPA is also currently utilizing a new multi-tiered testing framework in a research program designed to evaluate the potential for mercury release from various types of coal combustion wastes. The alternative framework evaluates the potential leaching of waste constituents over a range of values for parameters that affect the leaching potential. However, while all of these new tests are intended to provide a "true" indication of the leachability of waste constituents, there is still no substitute for field data from actual disposal or reuse sites.

Response:

The Toxicity Characteristic Leaching Procedure (TCLP) discussed in this comment would be used only to determine whether wastes from the proposed facilities are hazardous waste as defined under RCRA. Use of this test for this purpose is prescribed by regulations. The TCLP would not be used to predict waste leachability in the expected disposal or reuse settings for these wastes. The leaching tests from which results are presented in Section 4.1.8.2 used the Synthetic Precipitation Leaching Procedure (SPLP) protocol, not the TCLP.

Comment 41-26c:

Tests of coal gasification slags have found that these slags are similar in composition to pulverized coal boiler slag. As with boiler slag, the IGCC slags are non-leachable using the TCLP test. However, some limited field data are available from a long-term leaching test with coal gasification slag. These data illustrate the inability of laboratory tests (in this case the EP that pre-dates the TCLP test) to predict the potential real-world behavior of these wastes when landfilled. The tested slags were non-hazardous according to the EP toxicity criteria. However, the elemental concentrations measured in the laboratory extracts did not correlate well with the concentrations in the field test cell waters. Concentrations of the eight RCRA trace metals were well below concentrations that would cause the wastes to be classified as toxics according to the EP criteria. However, field measurements found that the Maximum Contaminant Limits (MCL) set by federal regulations were exceeded consistently for chromium and silver in leachate samples and selenium in surface water samples collected during the first months of monitoring.

In addition, concentrations of iron, manganese, sulfate and dissolved solids were significantly above secondary MCLs (levels meant to protect aesthetic qualities of water) in leachate from all tests cells. The study also found that chemical reactions were occurring that produce acid mine drainage and that some components in the gasification residues were transferred to waters in contact with the solids.

The study recommends that “proper engineering controls should be applied to coal gasification solid residue disposal sites ensure that ground water concentrations of species for which secondary MCLs have been established do not exceed acceptable limits.”

Response:

See response to comment 41-26a. As noted in that response, the residual waste regulations include provisions that prevent residuals from being disposed in settings where they could become saturated for extended periods of time (Section 7.2).

Comment 41-26d

Considerable additional information on slag leaching and toxicity apparently exists that has not been released publicly, but that might help better characterize IGCC slag’s environmental characteristics. Much relevant slag leaching data was also apparently filed in an EPA Docket several years ago that cannot now be located by EPA. It would probably be quite useful for the relevant parties to review these data and determine if they could be released in some form, if they could address some of the questions raised by the publicly available data.

Response:

The comment does not provide enough information to allow DOE to identify the data to which the commenter refers.

Comment 41-27

Table 4.1.2. is based on only one sample, presumably picked due to its unrealistically low numbers. The EIS should not list any chemical composition or leach test results from single tests. Averages and ranges from larger sets of data should be used in order to be more accurate and scientifically credible.

Response:

The EIS has been revised to present and discuss additional data on Gilberton Power Plant Ash. Table 4.1.2 has been revised to include the ranges of leaching test results on this plant's ash, as summarized by Hornberger et al. (2004). As the commenter states, the draft EIS presented data from chemical characterization and leach testing of one sample of Gilberton Power Plant ash. Comparison with data from analyses of 38 other ash samples from this plant (Figure 4.13(a) and Table 4.2 in Hornberger et al. 2004) indicates that the sample is representative because (for all listed constituents except molybdenum) the ash sample described in the draft EIS had concentrations similar to or higher than the median concentrations reported by Hornberger et al. (2004). However, a few ash leaching test results in the larger data set yielded leachate concentrations higher than those reported in the draft EIS.

Comment 41-28

PA DEP's groundwater monitoring documents show significant contamination of mine pool water from the dumping of Gilberton Power Plant's waste coal ash. When reviewing their data to finalize the EIS with credible information, be careful to accurately analyze which monitoring wells are upgradient and downgradient, since DEP labels some wells that are downgradient of ash dump sites as upgradient.

Response:

Section 4.1.4.1 has been revised to discuss groundwater quality monitoring data from the B-D Mining coal refuse processing and coal ash placement site in Mahanoy Valley. Due to the configuration of the underlying mine pools, there is no true upgradient monitoring well at this site (Hornberger et al. 2004). However, the absence of true upgradient monitoring wells does not prevent analysis of changes over time. Concentration trends observed in monitoring wells and in the mine pool do not indicate water-quality degradation due to coal ash disposal; improvements have been observed in some monitoring parameters, while other parameters are essentially unchanged (see Section 4.1.4.1). Hornberger et al. 2004 concluded that there had been no significant change in mine pool water chemistry (including no discernable degradation) as a result of coal ash placement at this site.

Comment 41-29

The DOE should be presenting the data from leach tests in its own data base of such test results for the coal ashes dumped in Pennsylvania mine fills under the Module 25s of those dumping permits, not just presenting the data from presumably one test completed by Hawk Mountain Labs, Inc. in Table 4.1.2. on page 4.31. The much more substantive data from this data base reveals that the FBC waste coal ash produced by the Gilberton Cogen Plant leaches

more lead than any other coal ash tested in the DOE data base. The average lead concentration leached in 12 tests on Gilberton ash was 0.271 mg/L, (18 times the federal Drinking Water Standard), compared to an average lead concentration of 0.14 mg/L, (9 times the federal Drinking Water Standard) leached in 71 tests on all other coal ashes in the data base. Even more significant than comparing the averages in this instance however is that the range of lead concentrations leached from the Gilberton ash was 0.128 mg/L to 0.520 mg/L compared to a range of 0.001 mg/L to 0.49 mg/L of lead leached from all of the other coal ashes in this data base.

Response:

DOE no longer has the specific data files referred to by the commenter. Leaching test data from the same source (i.e., state permit files) summarized by Hornberger et al. (2004) do not indicate lead levels as high as the commentor quotes. Also see the response to comment 41-27.

Comment 41-30

The rise in dissolved lead concentrations in the three coal ash monitoring wells operated under permit 54850202 from levels below Drinking Water Standard before ash placement to levels many times over the Drinking Water Standard after ash placement started at this site must be recognized in this EIS and accounted for. These monitoring points are monitoring very large volumes of water in minepools downgradient of the ash placed under this permit. What other sources would have contributed this lead to the mine pool other than the Gilberton coal ash? Data should be presented that substantiates that another source is more likely to have contributed this lead to the minepool, particularly given the assertion on page 4-30 that this gasification slag will come from the same culm that is burned to generate the Gilberton ash.

Response:

In response to this comment DOE reviewed groundwater monitoring data from this site, as presented by Hornberger et al. (2004), and did not find any indication of the increase in lead levels cited by the commenter. Also see the response to comment 41-28.

Comment 41-31

Table 4.1.2. lists mercury concentrations in Gilberton Power Plant ash as 0.2 ppm. This is impossible, unless the Gilberton Power Plant is releasing huge amounts of mercury into the air. EPA's ICR data (364 samples) shows waste anthracite in PA to be 0.19 ppm mercury. The 151 samples just from Schuylkill County average 0.18 ppm mercury. The 56 samples specifically from the Gilberton Power Plant average 0.235 ppm mercury. Since metals tend to concentrate in the ash, it's impossible for the levels of mercury in the ash to be as low as 0.2 ppm – lower than the waste coal that went into that power plant.

Response:

See the response to comment S10-8.

Comment 41-32

The data provided for Table 4.1.2. is clearly unrepresentative of the actual ash produced.

Response:
See the response to comment 41-27.

Comment 41-33

Comparing gasification slag to Gilberton Power Plant ash – if accurate data is used – could be somewhat relevant, but it would make more sense to include data from actual coal gasification slag. Leaching data exists on the slag from the Great Plains Coal Gasification Plant, located in Beulah, Mercer County, North Dakota. It can be found in Chapter 5 of EPA's 1990 Mineral Processing Waste Report to Congress here: http://www.epa.gov/epaoswer/other/mineral/chapter5.pdf The full report is here: http://cfpub.epa.gov/compliance/resources/publications/assistance/sectors/minerals/processing/reportstocongress/

Affirming my previous comments about how SPLP and TCLP leach tests underestimate leaching concentrations, page 5-5 of this report shows that, on balance, the EP leach tests show greater leaching results, both at higher levels and for a greater number of contaminants:

"Among EP results, arsenic, barium, chromium, and silver concentrations vary by more than two orders of magnitude. In addition, maximum leachate concentrations of many constituents (i.e., arsenic, barium, cadmium, chromium, copper, lead, manganese, selenium, and silver) detected in EP leach tests are approximately 10 times higher than concentrations detected by SPLP or TCLP analyses. Conversely, concentrations of aluminum, iron, uranium-238, and vanadium detected by SPLP analyses are greater than approximately five times the highest EP and TCLP concentrations."

On page 5-9, the report goes on to show that several toxic contaminants leach from the gasification slag (described in the report as "ash") at levels that would be harmful to human health and the environment:

"Of the 58 constituents analyzed in the ash solids, only uranium-238, thallium, arsenic, and chromium concentrations exceed the screening criteria. Among these constituents, uranium-238, thallium, and arsenic exceed the screening criteria with greater frequency and magnitude. However, only arsenic is present at a concentration that exceeds a screening criterion by a factor of more than 10….

- *Uranium-238 concentrations exceed the radiation screening criterion by a factor of almost 4, suggesting that the ash could pose an unacceptable radiation risk if the ash were used in an unrestricted manner (e.g., direct radiation doses and doses from the inhalation of radon could be unacceptably high if people were allowed to build homes on top of the ash or if the ash were used for construction purposes).*
- *Uranium-238, arsenic, and chromium concentrations in the ash may be present in concentrations that exceed the inhalation screening criteria. This suggests that if small particles from the ash are blown into the air in a high concentration (equal to the National Ambient Air Quality Standard for particulate matter), chronic inhalation of these constituents could cause a cancer risk exceeding 10^{-5}….*
- *Thallium and arsenic may be present in the ash at concentrations that exceed the incidental ingestion screening criterion, suggesting that these constituents could pose health risks if small quantities of the ash are routinely ingested over a long period of time (i.e., more than about seven years). Arsenic concentrations could pose a cancer risk of greater than $1x10^{-5}$, while thallium concentrations could cause adverse central nervous system effects.*

Of the 24 constituents analyzed in the leach tests, the following 10 constituents are present at concentrations that exceed the screening criteria based on water pathway risks: arsenic, lead, silver, selenium, mercury, chromium, sulfate, aluminum, molybdenum, and barium. All of these constituents are inorganics that do not degrade in the environment. Arsenic, silver, and lead are of relatively greater concern because their concentrations in the ash leachate exceed the screening criteria with the greatest frequency and magnitude. Arsenic concentrations exceeded the human health (drinking water) screening criterion in almost 60 percent of the samples analyzed; the median arsenic concentration exceeded the criterion by a factor of 8, and the maximum exceeded by a factor of 1,100. Silver concentrations exceeded the aquatic ecological screening criterion in 12 percent of the samples, and the maximum silver concentration exceeded the criterion by a factor of 370."

Response:

Details of the chemistry of leachates generated from solid residues of western coals are not useful in predicting the leaching behavior of slags from the proposed facilities. The trace element chemistry of coal byproducts, including slag, is controlled primarily by the chemistry of the original coal, and there are large differences between the chemistry of Pennsylvania anthracite culm and western coal.

Comment 41-34

Page 4-32 states that "earthen berms or dikes could be needed to provide effective management for the large quantities of wet sludge." Where would these be located? Would they be lined? Double-lined? Is there currently no plan for managing these wastes?

Response:

Any placement of wet sludge on the land as part of mine reclamation would be subject to Pennsylvania Department of Environmental Protection regulatory requirements for coal surface mining, as identified in Section 7.2. The potential details of sludge placement have not been determined; see the response to comment S2-1.

Comment 41-35

Page 4-32 states that "if sludges were transported to commercial landfills routinely, additional dewatering would probably be conducted to reduce weight and the potential for release of water after delivery." Where would this dewatering process take place? Would the World Resources Corporation facility in the county be utilized for this purpose?

Response:

Any sludge dewatering would be performed at the site of the proposed facilities. World Resources Corporation facility would not be utilized.

Comment 41-36, 41-37, and 41-38

Section 4 states that requirements of Pennsylvania residual waste management regulations (25 Pennsylvania Code Chapter 287) will be used to "minimize the potential for adverse impacts to water quality form management of the slag residue." (page 4-29)

Yet what it does not point out is that the refuse reprocessing permit 54850202 that governs the WMPI land in Mahanoy Creek Valley where the slag will be placed with ash

from the Gilberton Cogen Plant, is a minefill permit issued by PADEP that is exempt from meeting most basic requirements in the Pennsylvania residual waste management regulations (25 Pennsylvania Code Chapter 287).

There are no intermediate capping requirements, leaving the waste exposed to precipitation and leachate generation for extensive time periods in permit 54850202. There are no liner requirements preventing leachate from percolating directly from the slag into aquifers and the Boston Run, St. Nicholas and Gilberton minepools underneath the site governed by permit 54850202. Were the regulators to decide to dump the slag into the regional water table or the mine pool, they would be exempt from having to demonstrate that no groundwater contamination would occur, because permit 54850202 is likely a "mine drainage abatement project" exempt from this requirement touted on page 4-29 and 4-30 by the regulations (see Section 287.663(d)(6)).

Unlike PA residual waste landfills, there are no corrective action standards in permit 54850202 that would require any response from the regulator, slag generator or mine operator no matter how high contamination levels become in downgradient monitoring wells, and there is no requirement to monitor for any longterm period after the site has been filled with slag and coal combustion waste. Monitoring under permit 54850202 will stop when the Phase II mine bond is released, i.e., when the site surface has been revegetated to specified performance standards which can be 1-2 years after the waste filling at the site has concluded. Monitoring will not continue for 10 more years through a post closure monitoring period as is required for PA residual waste landfills (see Section 287.314 in the regulations).

Response:

The discussion in Section 3.5.2 of Pennsylvania Department of Environmental Protection permit 54850202 has been expanded to identify this as a coal surface mining permit that covers coal refuse (i.e., culm) reprocessing, coal preparation, and disposal of coal ash and biosolids. As the commenter notes, this type of operation is not subject to the same requirements as a solid waste landfill. For example, neither liners nor interim capping of waste are required, and post-closure requirements are different. However, the facility is subject to other Pennsylvania Department of Environmental Protection regulatory requirements designed for application to this type of operation. Section 7.2 has been revised to include additional information about these requirements. As that revised section indicates, materials to be used in mine reclamation must undergo chemical and physical analyses, leach testing, and other evaluations; mine reclamation plans must be developed and followed, including specifications for material placement intended to limit infiltration; and testing and monitoring are required. Furthermore, as discussed in Section 3.5.2, operations under permit 54850202 are inspected monthly by the Department of Environmental Protection, which has imposed financial penalties when environmental violations were discovered. The Department of Environmental Protection is responsible for establishing bonding requirements and release of bonds covering coal surface mining operations in Pennsylvania, so the issue of bonding for this type of operation is beyond the DOE's purview.

Comment 41-39

There are only three downgradient ash monitoring points under permit 54850202 and no upgradient monitoring points. This allows state mining regulators and the site operator to assert conveniently that culm mining is polluting the waters instead of coal ash, regardless of how severe contamination of waters becomes. A review of monitoring data at this site reveals

that the minepool water underneath this site is being substantively degraded with levels of pollution that did not occur 18 years ago before ash from culm remining was being placed at this site, under permit 54850202. Does the DOE believe that the monitoring system at this site will be sufficient to monitor impacts, identify the sources of those impacts and responds to them given its admission on page 4-29, "Contaminants potentially can leach into groundwater or surface water when solid byproducts are used in the environment."

Response:

See the responses to comments 41-28, 41-29, and 41-30. The Pennsylvania Department of Environmental Protection would be responsible for deciding on the sufficiency of environmental monitoring systems for permitted disposal sites associated with the proposed facilities.

Comment 41-40

The bond for permit 54850202 is calculated to cover only the costs of reclaiming the original contour of the surface mine and revegetating its surface to certain standards and includes virtually no resources for monitoring or remediating contamination of groundwaters or surface waters resulting from coal ash or slag placed at the surface mine at this site. Thus the bond does not include the costs covered in Section 287.331(c) of the regulations for residual waste landfills which emphasize that funds for monitoring and abatement of pollution are set aside in the bonds for coal ash landfills.

The result is that surety bonds ranging from $3,463,000 for Greene County's Hatfield Ferry coal ash landfill (which can accept up to 2.2 million tons of ash on 187 acres) to $20,741,700 for the Montour Power Station's coal ash landfill near Washingtonville, PA (which can accept a capacity of 4,992,221 tons of ash on 64 acres) compare to a total bond for permit 54850202 of $1,402,953 (for a site containing 3.7 million tons of ash on 125 acres). And permit 54850202 is slated to take more coal combustion waste as well as this gasification slag without any indication that this bond value needs to be raised.

Ash Dump Site	Capacity	Surety Bond
Greene County's Hatfield Ferry coal ash landfill	2,200,000 tons	$3,463,000
Montour Power Station's coal ash landfill near Washingtonville, PA	4,992,221 tons	$20,741,700
Permit 54850202 site in Schuylkill County	3,700,000 tons	$1,402,953

Response:

The Pennsylvania Department of Environmental Protection is responsible for establishing bonding requirements and release of bonds covering coal surface mining operations in Pennsylvania, so this issue is beyond the DOE's purview.

Comment 41-41

In my scoping comments, I asked several specific questions about dioxins and furans. No mention of dioxins or furans were in the DEIS. My comments asked that the EIS cover:

- The potential for formation of dioxins and furans throughout the process. This must include an understanding of:

  - where halogens will be present throughout the process;
  - the low temperature range at which dioxins and furans are formed and the residence time at which dioxin precursors are exposed to these conditions;
  - *de novo* synthesis of dioxins; and
  - the role of certain metals which serve as catalysts for dioxin formation.
- An estimate of projected dioxin/furan production throughout the process, including estimates of how much would be released through each products or waste stream. Data should be provided in I-TEQs as well as total mass.

Dioxins are the most toxic class of chemicals known to science and much research has been done on them. Since halogens and metal catalysts are part of the feedstock for this refinery and since the temperatures involved will pass through the dioxin formation range, it's critical that the EIS discuss potential for dioxin/furan formation.

Response:

As noted in revised Section 4.1.2.2, polychlorinated dibenzo(p)dioxin and polychlorinated dibenzofuran compounds (that is, dioxins and furans) are not expected to be present in the syngas from gasification systems for two reasons. First, the high temperatures in the gasification process would effectively destroy any dioxin/furan compounds or precursors in the feed. (Gasification temperatures within the refractory-lined reactor would typically range from 2200 to 3600 ºF, with associated pressures ranging from near atmospheric to 1200 psi.). Second, the lack of oxygen in the reduced gas environment would preclude the formation of free chlorine from HCl, thus limiting the potential for chlorination of any dioxin/furan precursors in the syngas. In addition, the temperature profiles where oxygen is present would not be in the favorable range (660 – 1290 ºF), for production of free chlorine from HCl.

Combustion of syngas in a gas turbine would not be expected to lead to formation of dioxin/furan compounds because very little of the particulate matter required for post-combustion formation of these chemicals would be present in the clean syngas or in the downstream combustion gases.

Measurements of dioxin and furan compounds in gasification systems reviewed by Orr and Maxwell (2000) confirm these theoretical expectations. Consistent with the commenter's request, measurements are reported in units of "TEQs." The TEQ is a toxicity equivalent used to report the toxicity-weighted mass of a mixture of dioxins and furans. For example, a one-gram-TEQ mass of a mixture of dioxins and furans has approximately the same toxicity as one gram of the dioxin 2,3,7,8-TCDD. Measured concentrations of dioxin/furan compounds in gas streams (i.e., raw syngas, clean syngas, sulfur removal acid gas, and flash gas) from a test gasifier evaluated by the EPA Superfund Innovative Technology Evaluation (SITE) Program were all comparable to the blanks, indicating that these species, if present, were at concentrations less than or equal to the method detection limits (parts per quadrillion, ~0.02ng/Nm^3 TEQ). Measurement results from a gasification facility in Germany have also shown extremely low levels of dioxin/furan compounds in the clean product syngas (less than 0.002ng/Nm^3 TEQ).

Comment 41-42

10 tons of annual emissions of hazardous chemicals such as benzene is a very significant impact. The EIS should describe some of the health implications of such large exposures to hazardous chemicals.

Response:

The comment refers to the amount of 10 tons given in Air Quality Program Permit No. 54-399-034, issued by the Pennsylvania Department of Environmental Protection for the proposed facilities, which establishes a maximum allowable limit for total facility emissions of less than 10 tons for any single hazardous air pollutant during any consecutive 12-month rolling period. The permitted limit functions as a cap to ensure that the proposed facilities would be a minor new source of hazardous air pollutants under the National Emissions Standards for Hazardous Air Pollutants regulations.

The permitted limit does not reflect the actual expected emissions of hazardous air pollutants. In WMPI's corresponding Pennsylvania Department of Environmental Protection application, an estimate of 3.7 tons per year was given for the sum of all hazardous air pollutants. The estimate was based on a worst-case scenario that the Pennsylvania Department of Environmental Protection required for comparison with the latter's corresponding 25-ton limit for the sum of all hazardous air pollutants during any consecutive 12-month rolling period.

WMPI has estimated that the actual sum of hazardous air pollutant emissions would possibly be about 1.5 tons per year. Consequently, the quantity of a single hazardous air pollutant would likely be less than 1 ton per year, which is considerably less than the value of 10 tons per year given in the comment. For example, WMPI estimates of annual air emissions of individual species include 2.4 lb for arsenic and 38.6 lb for mercury.

EIS Section 4.1.9.1 has been revised to include a discussion and example of a mixed source exposure (air, water, skin) to benzene.

Comment 41-43 and 41-44

The EIS should also drop any pretense of the permit limits functioning as a "cap to ensure" anything. Permit limits cannot be enforced if there is no required monitoring. The permit contains no requirements for stack testing of HAPs. Not continuously. Not monthly. Not even annually. The only testing for HAPs required in the air permit is a quarterly test for petroleum liquids in the facility, which will be used to *estimate* the air emissions. However, this cannot accurately portray the emissions once such liquids are burned and chemical constituents change in the combustion process.

The permit states, on page 43: *"To ensure the practical enforceability of the annual Hazardous Air Pollutant (HAP) emissions limit, the permittee shall, on a quarterly basis, perform tests of all petroleum liquids being stored and distributed at the facility in order to determine the HAP content of each."*

Response:

The permit requirements are as stated by the commentor. Section 4.1.2.2 of the EIS has been modified to clarify what the permit requires.

Comment 41-45

As weak as that is, it gets worse. The permit allows them to stop even the quarterly testing if they can document the HAP content of the liquids "provided by the manufacturer." It states: "*The quarterly testing of a petroleum liquid may be waived if the HAP content of*

the liquid can be demonstrated from documentation provided by the manufacturer (i.e. Material Safety and Data Sheets, manufacturer testing results, etc.)."

Isn't the "manufacturer" the refinery operator? In order words, the company can decide, on their own, to make up Material Safety and Data Sheets from test results on their manufactured liquids, then stop testing altogether?

Response:
See response to 41-43 and 41-44.

Comment 41-46

The EIS ought to be honest and state that unless they do actual stack testing (preferably with continuous emissions monitoring devices that are now available for many HAPs), they just won't know if they're in compliance with the "caps" in the air permit.

Response:

After the facility is built and operating, regulations require that continuous emission monitors (CEMs) be used to monitor SO_2, NO_x, and CO. In addition, Pennsylvania DEP plans to require stack testing for PM_{10} (particulate matter) and mercury. The facility would be required to comply with the recently promulgated Clean Air Mercury Rule, as it is an applicable regulation.

Comment 41-47

Page 2-15 briefly describes the six smokestacks, but is very vague about what processes they're connected to and what would come out of each stack. The EIS should explain whether all of them involve combustion units. It should explain why one stack is 100 feet taller than the others. It should also explain the chemical composition of the materials being sent to each stack (pre- and post-combustion, if combustion is involved)? It should explain which, if any, will have pollution control devices. The throughput for each stack should be included. Finally, will the facility have any flares that are not enclosed in a stack?

Response:

Every stack except the emergency stack would be associated with a combustion unit. The HRSG stack would discharge flue gas to the atmosphere from the HRSG of the combined-cycle plant. The two stacks associated with the F-T product work-up area would be from the hydrocracker reactor with a fired-heater operation and from hydrocracker fractionation with a fired-heater operation. One thermal oxidizer stack would emit gas from the sulfur recovery unit and tail gas unit that are part of the gasification process. The product loading stack would be positioned downstream of another thermal oxidizer to remove volatile organic compounds and hazardous air pollutants from products generated by the proposed facilities. Although the emergency flow of exhaust gas would result in a higher exit speed and consequently the sound level would be increased at the top of the emergency stack, the ambient ground-level noise would be mitigated by the higher stack height, and this stack height would also result in reduced concentrations of air pollutants at ground level due to additional vertical dispersion (300 ft vs 200 ft). Additional pollution control devices would include a selective catalytic reduction unit to remove NO_x and an oxidation catalyst to remove CO prior to release of emissions from the HRSG stack; baghouses to remove particles from multiple sources such as particles generated during milling and grinding of the

anthracite culm; and floating roofs on tanks to minimize emissions of volatile organic compounds. The proposed facilities would have no flares that are not enclosed in a stack.

Comment 41-48

The PM-10 and PM-2.5 attainment designations for Schuylkill County aren't appropriate for evaluating local air emissions impacts, as they're based on an air monitor 35 miles away in a different county, in a different airshed, on the other side of three mountains. The Reading, PA air monitor is also not surrounded by or directly downwind of fossil fuel or wood burning power plants. The Gilberton area is immediately surrounded by three waste coal power plants and is downwind of two additional waste coal power plants, two conventional coal power plants and a wood burning power plant. Any discussion of ambient air pollution, "attainment" and cumulative air impacts must take this into consideration and cannot rely on official "attainment" designations relying on air monitors in irrelevant locations.

Response:

See response to Comment 40-3. Until recently, the closest PM-10 monitoring station was located in Reading. The Pennsylvania Department of Environmental Protection has installed a PM-10 monitor at the Mahanoy State Correctional Institution adjacent to the proposed facilities to measure ambient PM-10 concentrations. In addition, high-volume particulate samplers to measure ambient concentrations of metals (i.e., arsenic, cadmium, chrome, nickel, and lead) and total suspended particles have recently been installed by the Pennsylvania Department of Environmental Protection at the Mahanoy State Correctional Institution, the Mahanoy City Sewage Treatment Plant, and the Frackville State Correctional Institution. All samplers began running on the same day (May 9, 2006) on a 6-day cycle (i.e., operating for one 24-hour period every sixth day).The discussion of cumulative impacts to air quality in EIS Section 6 has been expanded.

Comment 41-49

Section 5 discusses the possibility of an unsuccessful demonstration being followed by conversion of the facility to an integrated gasification combined cycle (IGCC) power plant. The EIS fails to mention that this would involve a substantive increase in local air pollution, as the gases that would normally be turned into liquids and burned in vehicles throughout the multi-state region would instead be burned all in one place, increasing the load of pollutants emitted in Schuylkill County.

Response:

As discussed in Section 5.2, if the facility were converted to an IGCC plant, total production would be reduced due to limits on turbine capacity. As a result, smaller amounts of feedstock and flux would be used. Correspondingly, air emissions would not be substantially changed from those associated with the proposed action.

Comment 41-50

WMPI's consultants prepared a spreadsheet estimating the refinery's arsenic and mercury air emissions. It concluded that 2.4 pounds of arsenic and 38.6 pounds of mercury would be

released into the air each year. It used standard EPA models that may not be representative of the combination of fuels and technologies proposed for the refinery. Nevertheless, the EIS ought to make these estimates available if not come up with a more accurate estimate of these HAP emissions as part of a broader analysis of emissions and mass balance of metals and other contaminants of concern. The WMPI spreadsheet, which had been made available to PA DEP, can be found here: http://www.ultradirtyfuels.com/AsHgEmissions.xls

Response:

As stated in the comment, the WMPI estimates of air emissions from the proposed facilities would be 2.4 lb per year for arsenic and 38.6 lb per year for Hg. These estimates have been added to Section 4.1.2.2 of the EIS. Also, an evaluation has been added to Section 6 discussing potential cumulative impacts resulting from emissions of mercury, beryllium, and arsenic from the proposed facilities combined with emissions of these pollutants from existing facilities.

Comment 41-51

Without CO_2 capture and sequestration, CO_2 emissions from producing and consuming a gallon of diesel from coal would result in 1.8 times as much CO_2 as a gallon of diesel from petroleum. Even with CO_2 capture and sequestration (which isn't planned for the WMPI refinery), Fischer-Tropsch diesel would emit 1.1 times as much CO_2 over its lifecycle as diesel from petroleum.[1]

The DEIS comments on global climate change attempt to minimize the global warming emissions by comparing to global emissions. With this sort of comparison, *any* single facility would look like an insignificant contributor. Would one make the same comparison for mercury or other toxic emissions? This is a really inappropriate way of viewing pollution and only serves a public relations purpose, not a defensible scientific purpose. Since Pennsylvania is already responsible for about 1% of global greenhouse gas emissions and since the global emissions are already excessive and causing irreversible climate disruption, no added amount of greenhouse gas emissions is justifiable. Making things worse, the 1% figure doesn't include mine fires and Pennsylvania is responsible for about 94% of mine fires in the U.S. It also doesn't account for the fact that three large new waste coal burning power plants were permitted in the past year… each of which would use fluidized bed boilers, which are known to convert nitrogen into nitrous oxide (a greenhouse gas), resulting in a net 15% increase in greenhouse gas emissions over traditional coal-fired boilers. This refinery is adding insult to injury in the global warming department and no means of minimizing or downplaying the numbers can change that fact.

Response:

See response to Comment 38-5. The revised cumulative effects analysis in Section 6.1 uses the factors cited by the commenter. Mines fires contribute to the cumulative emissions of greenhouse gases, but are beyond the scope of this EIS.

Comment 41-52

[1] Marano, John J, and Ciferno, Jared P, Life-Cycle Greenhouse-Gas Emissions Inventory For Fischer-Tropsch Fuels, prepared for U.S. Department of Energy National Energy Technology Laboratory, June 2001.

DOE has refused to evaluate alternative technologies, arguing that the EIS only needs to evaluate the "no action" alternative. By defining the purpose of the funding very narrowly ("demonstrate the production of electricity, steam, and liquid fuels from coal waste by integrating coal gasification and F-T synthesis of liquid hydrocarbon fuels"), it forgoes any true look at alternatives. There are environmentally-preferable alternatives for all objectives that could be met by this proposed refinery. By mandating that all objectives must be met through a single project, rather than an alternative that could include a combination of projects, the DEIS violates the spirit, if not the letter, of NEPA.

Response:

The Clean Coal Power Initiative (CCPI) is a cost-shared partnership between government and industry established to demonstrate advanced coal-based, power generation technologies. The goal is to accelerate commercial deployment of advanced technologies to ensure the United States has clean, reliable, and affordable electricity. The industrial (non-federal) partner must provide a matching cost share of at least 50%. This restriction places DOE in a much more limited role than if the federal government were the owner and operator of the project. In the latter situation, in which DOE would ordinarily be required to review a wide variety of reasonable alternatives, is necessarily more restricted. It is appropriate in such cases for DOE to give substantial weight to the needs of the proposer in establishing reasonable alternatives to the proposed action. In addition, under the CCPI Program, DOE's role is limited to approving or disapproving the project WMPI PTY., LLC, has proposed. Thus, the only reasonable alternative to the proposed action is the no-action alternative.

Comment 41-53

WMPI, other developers and even governors are already discussing alternative sites in Alaska, Colorado, Illinois, Indiana, Kentucky, Montana, Ohio, southwestern Pennsylvania, Virginia, West Virginia and Wyoming. Most of these sites would even make more sense, given that a commercial-scale F-T coal-to-diesel facility would not be able to run on anthracite waste coal (due to geographic and resource limitations), but on bituminous coal or some other variety of coals not found in eastern Pennsylvania. The EIS needs to properly evaluate alternative sites.

Response:

DOE selected for further evaluation the Gilberton Coal-to-Clean Fuels and Power Project as proposed by WMPI PTY, LLC, at the site proposed in Schuylkill County, Pennsylvania. DOE has not received, and is not aware of any other F-T coal-to-liquid fuels and power facility with DOE support sited at another location by WMPI.

Comment 41-54

Page 4-19 states: "No long-term impacts on the hearing ability of wildlife species would be expected from construction-generated noise."

Please provide citations for this statement. If you can't document it, don't put such definitive statements in print. Please don't simply make up information. It makes you look bad and damages the credibility of your writings.

Response:

The last sentence of paragraph 3 of Section 4.1.6.1 has been rewritten to explain why no long-term impacts would be expected for larger wildlife species. It now reads:

Because larger and more mobile species would tend to avoid construction areas due to associated noise, no long-term impacts on the hearing ability of these species would be expected from construction-generated noise.

Comment 41-55

Noise should be measured from the loudest equipment that could be on the edge of the refinery property, closest to the prison and calculated for the distance to the closest residential section of the prison or the closest place where prison workers would spend a significant amount of time.

Response:

Noise levels decrease with distance from the source. There are no noise sources anticipated at the proposed facility which could produce hearing loss 2,600 feet away. Therefore, the concern is one of annoyance. See revised discussion in Section 4.1.10.

Comment 41-56

[Referring to pages 4-19 and 4-20 which notes a 26-year lifetime for the facility] It's good to see evaluations over the 26-year operating life. The EIS ought to be consistent and evaluate ALL impacts over the life of the refinery, not just those which help the EIS make the project look favorable. Since many waste coal piles are currently covered to some degree with vegetation, this evaluation must consider the trees and other plant life that would be cleared to access these piles. It also ought to consider the fact that the enormous amount of solid waste would be dumped throughout the region, possibly returning to the same waste coal pile sites that are supposedly being "cleaned up." Waste coal slag doesn't make for good land reclamation and probably won't be a very good replacement for deciduous forest.

Response:

In Section 5, the EIS evaluates impacts over the expected operating life of the facilities, which has been changed to 50 years (including the 3-year demonstration period). Section 5 evaluates long-term impacts that accumulate with time; other impacts would be nearly identical to those discussed in Section 4 for the demonstration.

The evaluation of impacts to forests takes into account that some of the culm piles that would be used by the proposed facility for fuel are currently covered to some degree with vegetation, and that this vegetation would be initially cleared. There are also numerous areas of culm in the Mahanoy Creek valley that have not been reclaimed or revegetated (Cravotta 2005), and some of these areas would also be used by the proposed facility. All of these areas would be required to be revegetated under Pennsylvania law. Any slag not used as fill material for mine reclamation, or used commercially, would likely be placed in landfills which would also eventually require revegetation. As more area is reclaimed there should be a net gain in vegetation with vegetated areas undergoing the typical successional sequence to deciduous forest.

Comment 41-57

Page 4-26 states the assumption that construction workers would average two per vehicle. This seems pretty high for temporary construction work trips. Please document that this is a reliable average for this type of work and the geographic region in question.

Response:

The comment is correct in that average vehicle occupancy to and from work in the United States and Pennsylvania is below 2.0 persons per vehicle. For the United States, average vehicle occupancy to and from work in 2001 was 1.1 persons per vehicle (*Transportation Energy Data Book*, Edition 24, U.S. Department of Energy, December 2004). In Pennsylvania, carpools of 2.0 or more persons comprise only 12% of total vehicle occupancy for workers, while vehicles with only 1 person comprise 88% (*American FactFinder*, U.S. Census Bureau, accessed at http://factfinder.census.gov on February 21, 2006). However, the analysis assumes 2.0 persons per vehicle for the construction work force because (1) many of the construction workers would be driving from other parts of the region outside of the immediate project vicinity and would be more likely to carpool and (2) the project proponents would encourage car-pooling during construction to help reduce impacts to traffic flow and safety on the local road network. Section 4.1.7.8 has been revised to make these assumptions explicit.

Comment 41-58

Pages 2-8 and 2-9 describe rail shipping and state that "special permits and advanced planning would be required." However, the necessary permits aren't listed in Section 7, where permit requirements are addressed. The EIS should address this.

Response:

The need for special permits and advanced planning refers to the use of state highways to truck heavier components to the site from the rail siding approximately 1 mile away. Each component would need to be disassembled to the smallest size that would not destroy the usefulness of the component upon reassembly at the site. A truck shipment would be considered a super load if (1) the gross weight (including the truck) exceeds 201,000 lb, (2) the total length exceeds 160 ft, or (3) the total width exceeds 16 ft. A super load would require an escort by at least one state trooper. The permitting process for a super load requires two steps. First, a preliminary application must be submitted at least three weeks before the anticipated initial move date. The preliminary application must include documentation of a physical route survey performed to ensure that the super load can negotiate all turns on the proposed route. The preliminary approval is valid for 12 months. Second, upon approval of a preliminary application, a final application should be submitted for each move five full working days before each move to allow adequate time for coordinating the state escort. Section 7 has been updated to incorporate these permitting requirements.

Comment 41-59

Page 4-12 states: *"a concern was expressed regarding airborne emissions resulting from vehicles traveling over red anti-skid material applied to roads (Section 1.5). This material is bottom ash from the existing Gilberton Power Plant, which is applied to alleviate*

treacherous road conditions during the winter. Because the bottom ash from the proposed facilities would be in the form of a glass-like slag, which is not suitable as an anti-skid material and would not be applied to the roads, this concern would not become an issue."

This is a concern for many in the community, but was misunderstood by the author of the DEIS. The concern isn't that slag from the proposed refinery would be used as anti-skid material, but that the additional traffic would exacerbate an existing problem whereby the Gilberton power plant ash (when used as anti-skid material) is pulverized by vehicles, creating a toxic dust that contributes to local respiratory and other health problems.

Response:

As discussed in Section 4.1.7.8, the 1,000 additional daily vehicle trips for workers during the peak construction period would represent increases of 10% and 22% over existing traffic on State Route 61 and State Route 1008, respectively. Traffic increases from current traffic levels would be smaller during construction periods other than the peak construction period. During the demonstration and long-term project operations, traffic increases from current levels would be smaller but would be more long lasting. The increased vehicle traffic would contribute to the breakup of the bottom ash from the existing plant. However, application of this anti-skid material is related to the occurrence of hazardous road conditions, not to increased traffic volume. Construction and operation of the proposed facilities would not alter the incidence of hazardous road conditions. Consequently, the proposed project is not expected to affect either the amount and frequency of bottom ash applications to local roads or public health or aesthetic effects arising from the applications.

Comment 41-60

In addition to the rail shipping permit mentioned above, Section 7 is missing two permits that WMPI is currently seeking from PA DEP. These are the Water Quality Management Part II Permit and the Storage Tank Site Specific Installation Permit.

Response:

Section 7.2 has been revised to include information about these permit requirements and the permit applications that WMPI has submitted to the Pennsylvania Department of Environmental Protection.

Comment 41-61

The DEIS makes several claims that the impacts of the proposed refinery won't effect the prison population adjacent to the property where the facility hopes to locate. Page 4-26 states that "the Mahanoy State Correctional Institution is a sealed facility in which inmates and employees would not be exposed to outside air except during periods of outdoor activity." The facility is not "sealed." Like any other commercial business, they have ventilation systems that bring in outdoor air in the course of circulating air throughout the buildings. They have 25% outdoor air coming in all the time, even in winter. No special air filters are installed to handle the sorts of pollutants that the refinery would release next to the prison. Also, the prison is made up of many buildings and prisoners and prison workers regularly must walk outside to get between buildings throughout the day. There is no air filtration system or closed air system that protects prisoners and prison workers from refinery emissions.

Clearly, the impacts of the refinery will be disproportionately felt by the predominantly black and Hispanic prisoner population. This is a violation of Executive Order 12898 of February 11, 1994, requiring "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." It is also a violation of the Civil Rights Act of 1964, which prohibits federal funds for being used for actions that have a discriminatory effect on racial minorities.

Response:

References to the Mahanoy State Correctional Institution as a sealed facility have been removed from the EIS. See response to comment 31-26.

Comment 41-62

The DEIS relies on risk studies that would occur in the future. Page 4-34 mentions a Hazard and Operability review or Process Hazards Analysis and a Risk Management Plan, yet these studies haven't been done. Given the experimental nature of this facility, we can assume that accident risks will be somewhat higher than usual for refineries. The EIS ought not be finalized until these studies have been done, so that the true environmental impacts can be included in the final EIS.

Response:

Sect. 4.1.9.1 has been revised in response to this comment to more clearly describe the plan and program for addressing potential accidents associated with this facility. The identification and analysis of the hazards and accidents for the facility have yet to be completed, as mentioned in this comment. However, the studies are to be completed and submitted to EPA prior to the beginning of operations. The purpose of these studies is to protect public health, the environment and workers from hazardous materials and the consequences of accidents. Sufficient information concerning the facility design details and operating conditions is not currently available to allow for these analyses to be performed as part of the EIS. Consequently, they have been deferred to the analysis of safety of the facility, where they will be addressed fully. Facilities that are much larger and complex with much larger inventories of hazardous materials have been regulated satisfactorily under 40 CFR 68 and 29 CFR 1910.119 without adverse consequences to the public, environment or workers from operation. The completion of these analyses is not necessary to provide the needed information to support the selection of the environmentally preferred alternative for the proposed action. See the response to Comment S2-1.

Comment 41-63

Page 4-34 mentions ConocoPhillips reports that provide probabilities for catastrophic failures. However, the EIS doesn't mention the types of failures and accidents that are quite common and not without significant impacts on worker safety, environmental health and human health. Refineries face accidents pretty routinely – far more frequently than the "catastrophic failure" rates mentioned in the DEIS. These routine accidents should be quantified and references in the EIS.

Response:

Section 4.1.9.1 has been revised in response to this comment. Frequent accidents with low consequences are the focus of 29 CFR 1910.119, which are addressed in the Risk Management Plan prepared for compliance with 40 CFR 68 and 29 CFR 1910.119. See the response to Comment 41-62.

Comment 41-64

An April 2005 press release from WMPI states: "With the completion of the Gilberton Coal-to-Clean Fuels and Power Plant financing and following the successful start-up and operation of this facility, larger-scale commercial plants (10-12 fold increase in output size) are likely to be constructed." (http://www.ultracleanfuels.com/articles/wmpi_041805.htm)

John Rich was quoted in the Charleston Gazette on 9/18/2005: "Eventually, Rich said, he sees the plant building out its capacity, requiring a $4.2 billion investment." (http://www.ultracleanfuels.com/articles/cgazette_091805.htm)

Since Rich foresees expanding this proposed refinery to a size far larger than currently proposed, the cumulative impacts section ought to look at the impacts of future expansion of the refinery.

Response:

See response to comment S6-1. The assessment of potential cumulative impacts in Section 6 has been revised.

Comment 41-65

Because DEP set the permit limits just a hair below the "significant impact levels," the DEIS argues on page 6-1 that "because the analysis indicated that maximum predicted concentrations would be less than the significant impact levels, the proposed facilities would not contribute to cumulative air quality impacts."

This is ridiculous. Just because a permit limit for a single facility was set just below a regulatory limit that would require air modeling, there is no justification for assuming that a facility would not contribute to cumulative air quality impacts. With the twisted logic in the DEIS, one could site 100 facilities next to one another, each with permit limits of 99.9 tons/year for most regulated pollutants and argue that there is no cumulative impact, since each individual facility is under a regulatory limit.

In the reality of Schuylkill County air quality, there are five waste coal burning power plants in the county, three others in neighboring counties and three more pollution-spewing power plants (two coal and one wood) sending their pollution towards the county. There are numerous other air pollution sources as well. The refinery would add to the cumulative air pollution impacts. The EIS needs to look at this honestly and not use twisted logic to dodge this evaluation.

Response:

Section 6 has been revised to include an assessment of the cumulative air quality impacts of this facility in combination with the cogeneration plants and proposed biofuels plant in the area. As shown in Table 6.1, predicted total concentrations of modeled air pollutants (sum of background concentrations plus concentrations from the proposed project and six existing power plants) would be no greater than 42% of the respective National Ambient Air Quality Standard (NAAQS). For many individual pollutants, the cumulative impact would be less

than 35% of the NAAQS. Although air emissions estimates from the proposed Greenfield biofuels plant are not yet available, permitted emissions limits for VOCs would increase Schuykill County's total VOC emissions by 0.1% (Section 6.1.1).

Comment 41-66

Pages 6-1 and 6-2 state that the temporal time frame for the cumulative impacts analysis would be equal to the 26-year lifetime of the refinery. Due to their high cost, small economy of scale, expiring power purchase agreements and diminishing supplies of economically recoverable waste coal within this time frame, the waste coal burning power plants in the region shouldn't be expected to last 26 years. The analysis should evaluate a realistic lifetime for these plants when evaluating the cumulative impacts and the amount of remaining waste coal to feed the refinery.

Response:

The time frame for assessments of potential impacts of commercial operation (in Section 5) and potential cumulative impacts (Section 6) has been extended from 26 years to 50 years.