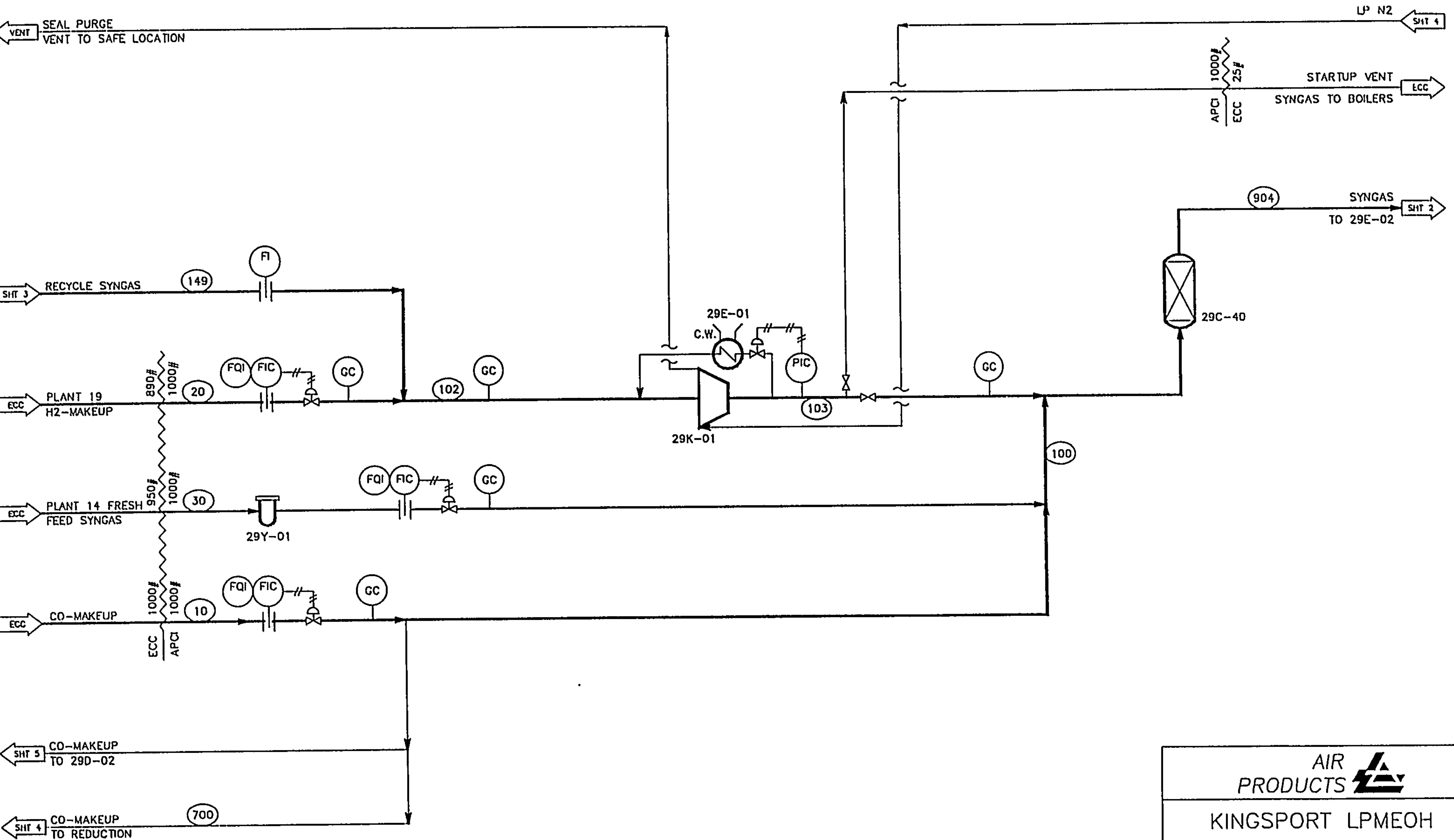
# 6.0 ENVIRONMENTAL IMPACTS

## 6.1 Air Resources

### 6.1.1 Air Pollutant Emissions and Controls

The proposed project would result in very small increases of carbon monoxide gas and of volatile organic emissions with no increases of sulfur dioxide and nitrogen oxides to the atmosphere. The new unit would be integrated into the existing production facility and would benefit from the use of existing air emission control equipment. There would be no changes in emissions from the coal gasification system which supplies the feedstock to the liquid phase methanol unit. The process flow diagram is shown in Figure 6.1-1, and integration with existing Eastman processes is shown in Figure 6.1-2.

The largest emissions from the proposed project consists of purge streams from 29C-03 (H.P. Methanol Separator), 29C-11 (Methanol Stabilizer Reflux Drum), and 29C-21 (Methanol Rectifier Reflux Drum), streams 148 and 211. An intermittent stream will vent periodically from 29C-31 (Reduction Catalyst Accumulator) during catalyst reduction. These streams vent to a waste gas header, where waste gases from various Eastman processes on Long Island are combusted in an on-site boiler. If the proposed project is built, one waste gas stream from the current methanol process would be eliminated and the above mentioned streams would be added to the waste gas header. Changes in the overall waste gas header flow are shown on Table 6.1-1, which shows a percent increase from 3.3% to 21.8%, depending on




NOTE: LOCATION OF 29C-40 GUARD BED IS SUBJECT TO CHANGE PENDING FINAL RESULTS OF FEED STREAM ANALYSIS

| 9/27/94 | JMR/CMC | VES | WRB | TEC | ADB | DPD | GAM | DPB | ECH | JLD |
|---|---|---|---|---|---|---|---|---|---|---|
| DWG DATE | PROCESS ENGINEER | PROCESS APPROVAL | BUSINESS AREA REPRESENTATIVE | SYSTEMS ENGINEER | PSG TECHNOLOGY | PROJECT ENGINEER | PROCESS CONTROLS | ENGINEERING SAFETY | PRODUCTION & DELIVERY | MACHINERY |

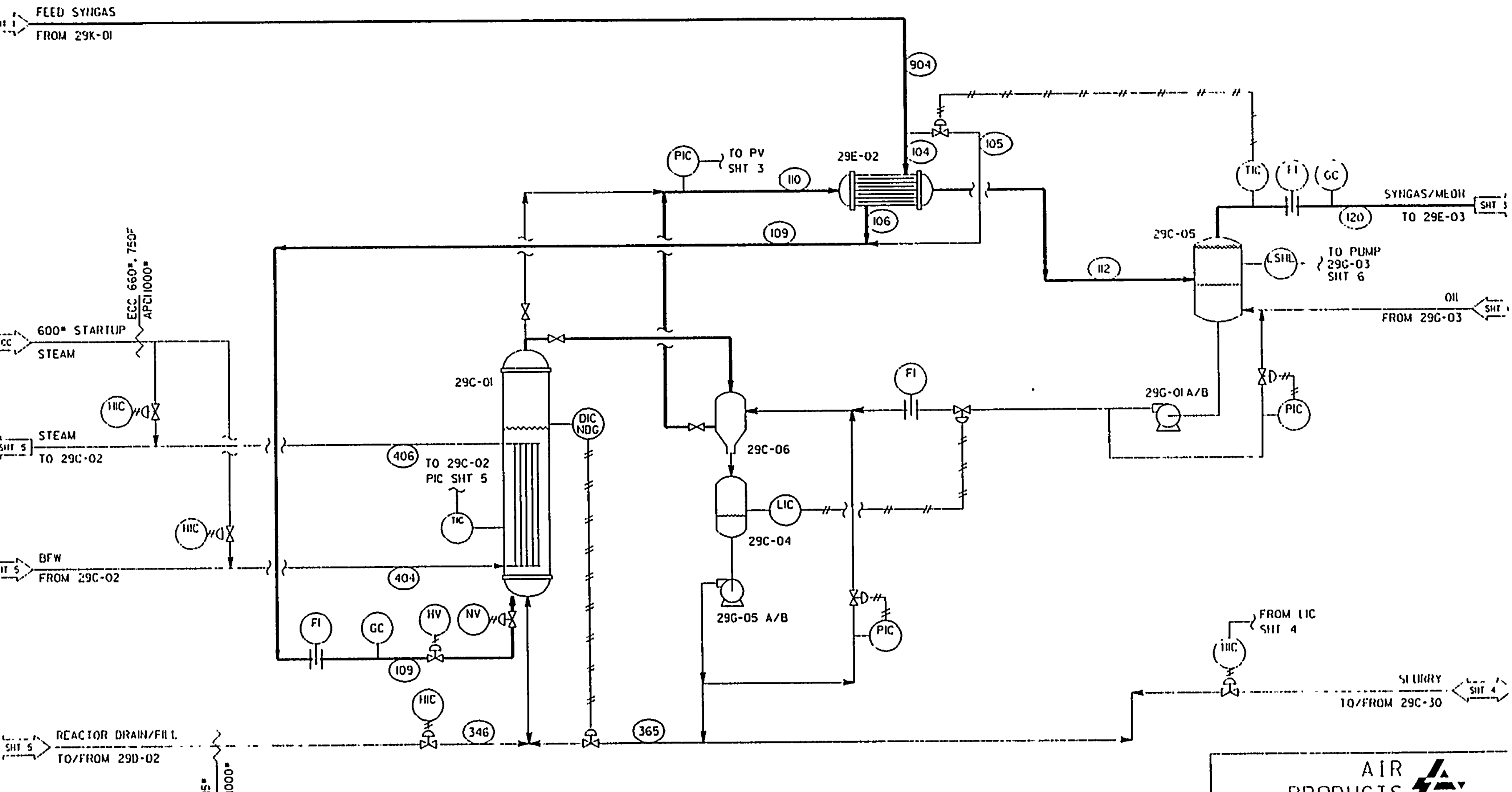
AIR PRODUCTS

KINGSPORT LPMEOH
FEED SECTION

| | | |
|---|---|---|
| DRG. NO. LPM1 | | SHEET NO. 1 |
| 00-3-8215 | | REV. NO 0* |

FIG 6.1-1

Rev 3/8/95 [initials]




AIR PRODUCTS

KINGSPORT LPMEOH
SYNTHESIS SECTION

| 6/16/94 | JMR | VES | WRB | TEC | ADB | DPD | GAM | DPB | ECH | JLD |
|---|---|---|---|---|---|---|---|---|---|---|
| DWG DATE | PROCESS ENGINEER | PROCESS APPROVAL | BUSINESS AREA REPRESENTATIVE | SYSTEMS ENGINEER | PSG TECHNOLOGY | PROJECT ENGINEER | PROCESS CONTROLS | ENGINEERING SAFETY | PRODUCTION & DELIVERY | MACHINERY |

DRG. NO. LPM2
00-3-8215
SHEET 2
REV. N 0

FIG 6.1-1

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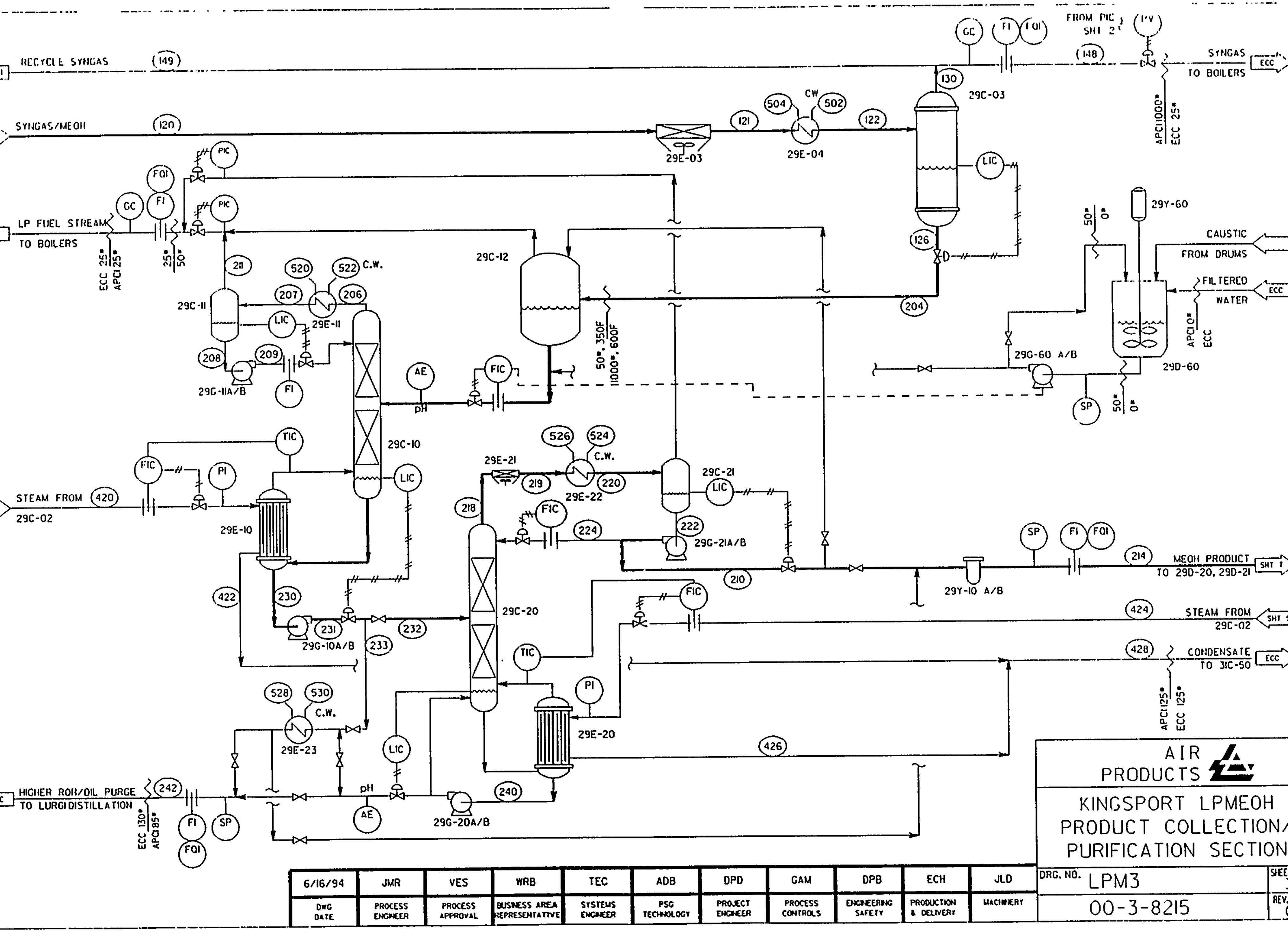
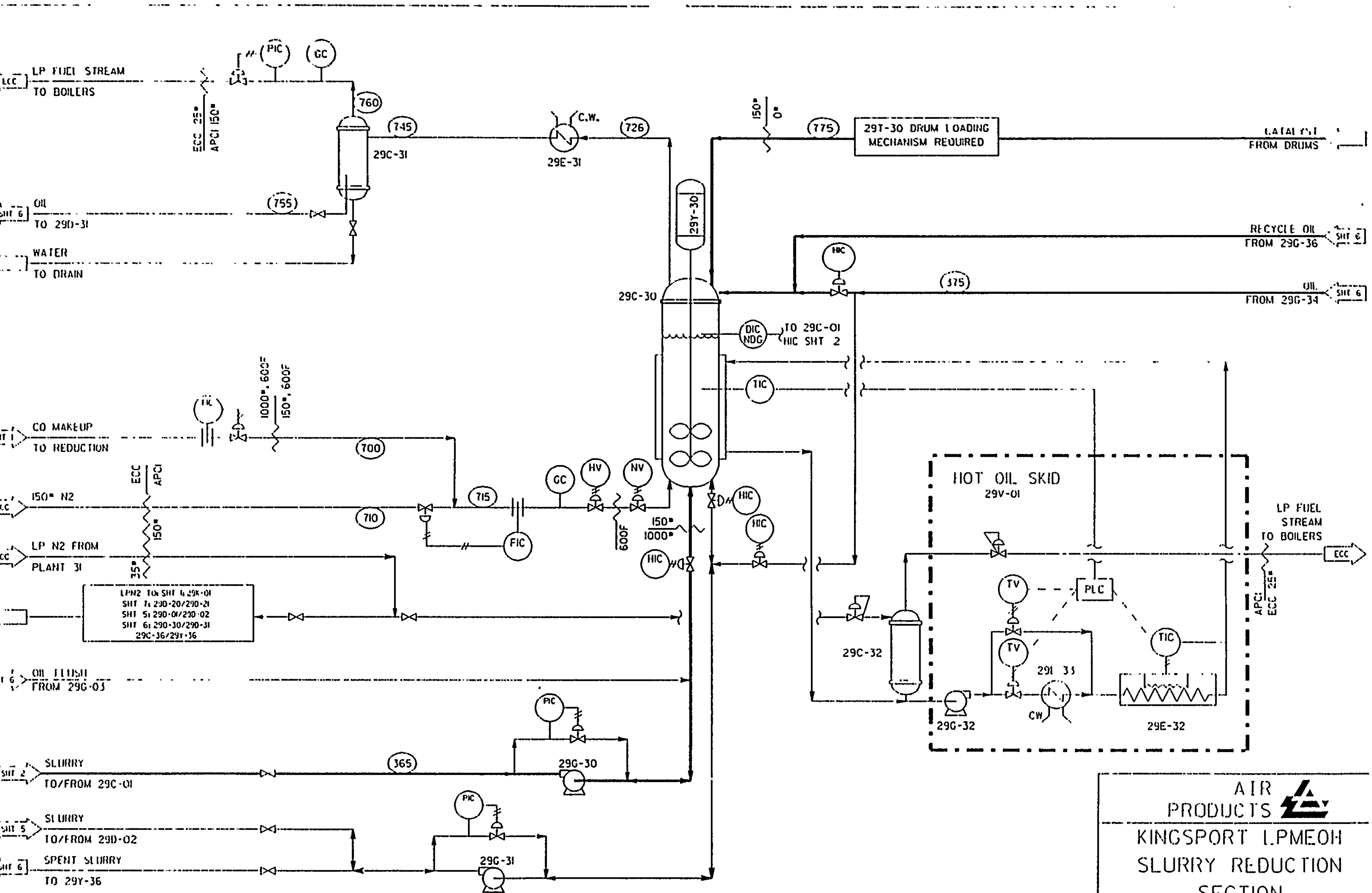



FIG 6.1-1

Rev 3/8/95




| 6/16/94 | JMR | VES | WRB | TEC | ADB | DPD | GAM | DPB | ECH | JLD |
|---|---|---|---|---|---|---|---|---|---|---|
| DWG DATE | PROCESS ENGINEER | PROCESS APPROVAL | BUSINESS AREA REPRESENTATIVE | SYSTEMS ENGINEER | PSG TECHNOLOGY | PROJECT ENGINEER | PROCESS CONTROLS | ENGINEERING SAFETY | PRODUCTION & DELIVERY | MACHINERY |

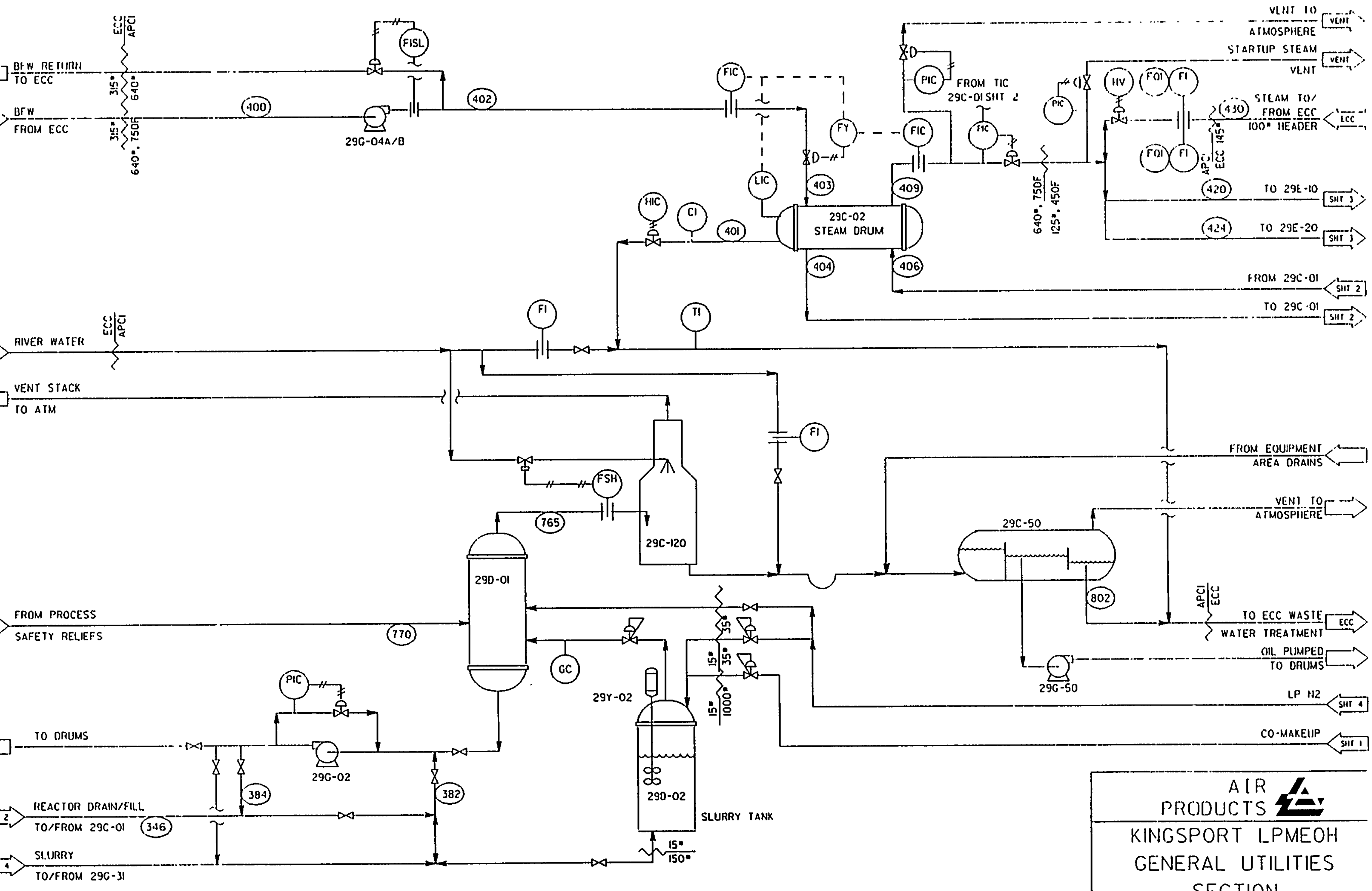
AIR PRODUCTS

KINGSPORT LPMEOH
SLURRY REDUCTION
SECTION

DRG. NO. LPM4 — SHEET 4
00-3-8215 — REV. NO. 0

FIG 6.1-1

Rev 3/8/95




AIR PRODUCTS

KINGSPORT LPMEOH
GENERAL UTILITIES
SECTION

| 6/16/94 | JMR | VES | WRB | TEC | ADB | DPD | GAM | DPB | ECH | JLD |
|---|---|---|---|---|---|---|---|---|---|---|
| DWG DATE | PROCESS ENGINEER | PROCESS APPROVAL | BUSINESS AREA REPRESENTATIVE | SYSTEMS ENGINEER | PSG TECHNOLOGY | PROJECT ENGINEER | PROCESS CONTROLS | ENGINEERING SAFETY | PRODUCTION & DELIVERY | MACHINERY |

DRG. NO. LPM5 00-3-8215 SHEET 5 REV. NO 0

FIG 6.1-1

Rev 3/8/95

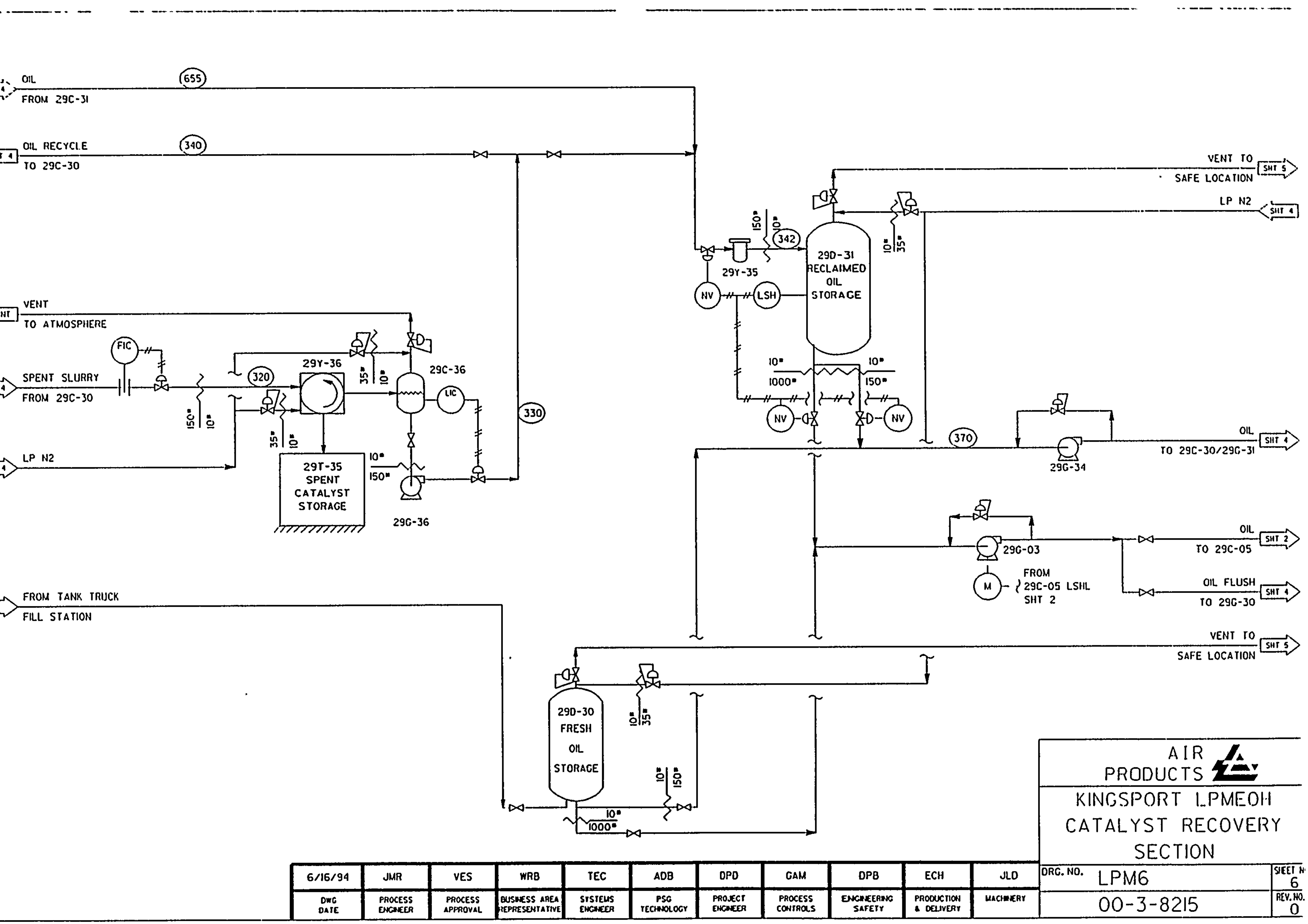
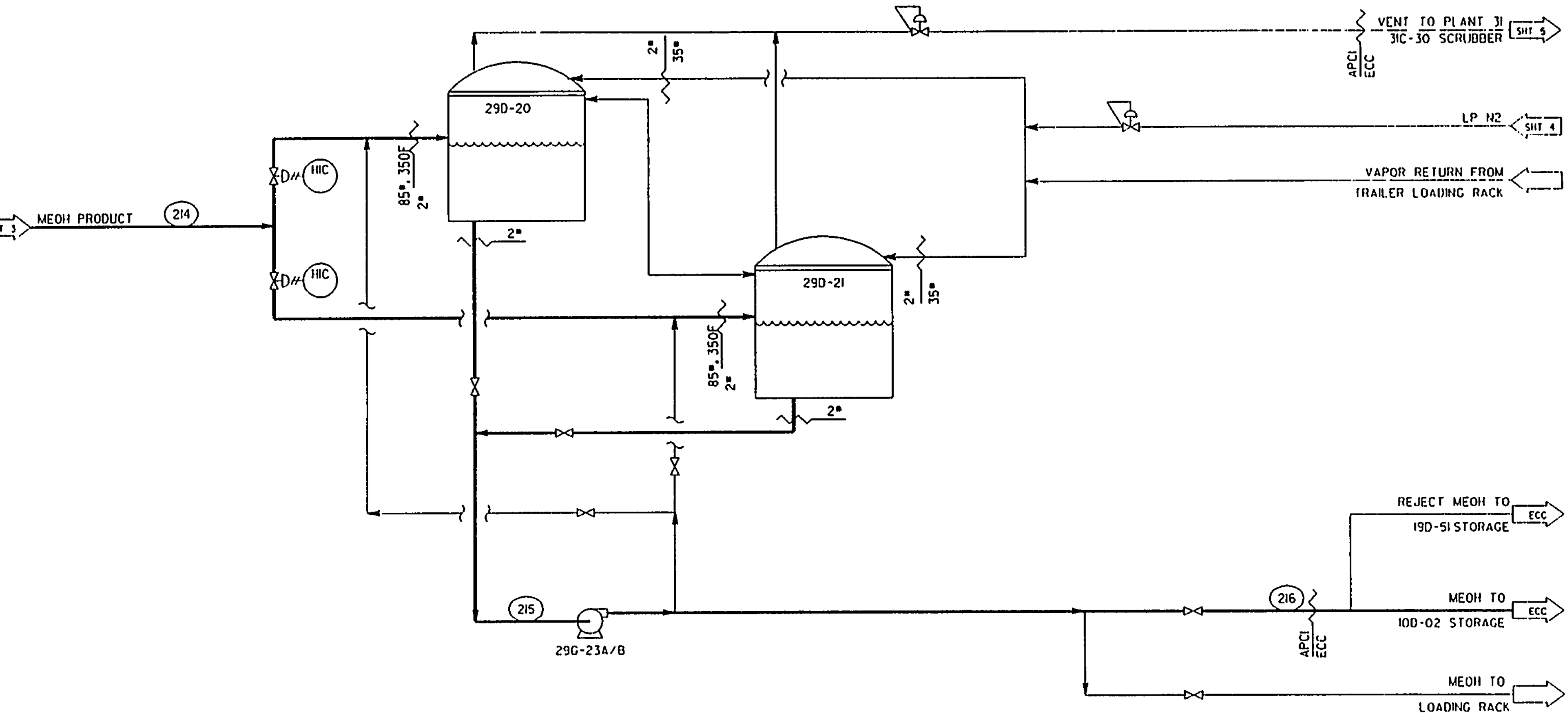



FIG 6.1-1

Rev 3/8/95




AIR PRODUCTS

KINGSPORT LPMEOH
PRODUCT STORAGE
SECTION

| 6/16/94 | JMR | VES | WRB | TEC | ADB | DPD | GAM | DPB | ECH | JLD |
|---|---|---|---|---|---|---|---|---|---|---|
| DWG DATE | PROCESS ENGINEER | PROCESS APPROVAL | BUSINESS AREA REPRESENTATIVE | SYSTEMS ENGINEER | PSG TECHNOLOGY | PROJECT ENGINEER | PROCESS CONTROLS | ENGINEERING SAFETY | PRODUCTION & DELIVERY | MACHINERY |

DRG. NO. LPM7
00-3-8215
SHEET NO 7
REV. NO. 0

FIG 6.1-1

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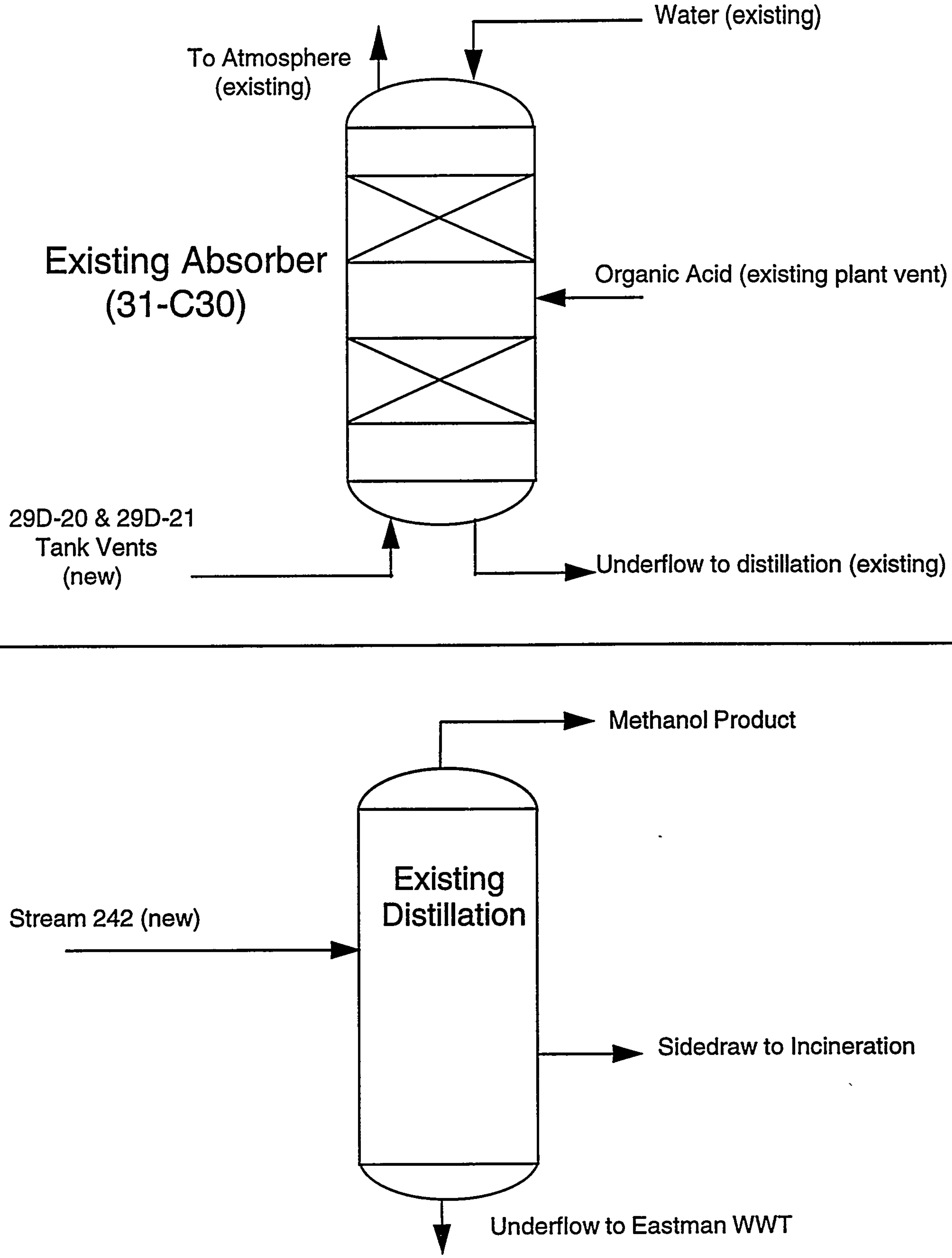


**Figure 6.1-2  Integration with Existing Eastman Process**

the conditions and the units compared. In current air regulations (such as New Source Performance Standards), this control strategy of venting gases to an on-site boiler is considered equivalent to controlling emissions by using a thermal oxidizer.

**Table 6.1-1. Changes in the Waste Gas Header Stream**

| | Before LPMEOH™ | After LPMEOH™ | Percent Change |
|---|---|---|---|
| Waste Gas to boilers | | | |
| Calculated maximum, lb/hr | 32,327 | 38,059 | +17.7 |
| acfh (40 C, 26 psia) | 397,000 | 410,000 | +3.3 |
| Calculated average, lb/hr | 12,132 | 14,785 | +21.8 |
| acfh (40 C, 26 psia) | 154,000 | 165,000 | +7.1 |
| | | | |
| Permitted waste gas to boilers | | | |
| Maximum, acfh | 594,000 | 594,000 | 0 |
| Average, acfh | 489,000 | 489,000 | 0 |
| | | | |

Five storage tanks would be expected to be built for the new demonstration unit. The two methanol storage tanks would be vented through an existing absorber. The three mineral oil tanks would be vented to the atmosphere. The storage tank emissions are shown on Table 6.1-2 and are all volatile organic compounds.

## Table 6.1-2. Tank Emissions

| Tank | ton/yr | lb/yr |
|---|---|---|
| 29D-20[1] | .036 | 72.5 |
| 29D-21[1] | .036 | 72.5 |
| 29D-02[2] | <0.005 | < 10 |
| 29D-30[2] | <0.005 | < 10 |
| 29D-31[2] | <0.005 | < 10 |

[1] Emissions controlled by existing absorber

[2] Vented to atmosphere

Emissions from the absorber are currently permitted for .526 ton/year of volatile organic compounds and are calculated to increase by .073 tons per year due to the addition of 29D-20 and 29D-21. Because of low volatility of mineral oil, the emissions are negligible from the mineral oil tanks.

Fugitive emissions from the pumps, valves, connectors, compressor seals, and pressure relief devices have been calculated. The emissions estimates are based on stratified emission factors and available equipment leak monitoring data on processes at Eastman's manufacturing facility. The equipment leak emissions estimates are shown on Table 6.1-3.

**Table 6.1-3. Equipment Leak Emissions**

| Pollutant | Current, ton/year[1] | LPMEOH™, ton/year | LPMEOH™, % of current[2] |
|---|---|---|---|
| CO | 38.1 | 2.1 | 5.5 |
| Volatile Organic Compounds (VOC) | 73.1 | 7.3 | 10 |
| other[3] | 6.3 | 1.42 | 6.7 |
| Total | 117.5 | 10.8 | 8.3 |

[1] all permitted equipment leak emissions from Eastman manufacturing facilities on Long Island

[2] (LPMEOH™ emissions/ current emissions) * 100%

[3] includes particulates, hydrogen, sulfur compounds and nitrogen compounds

These emissions are estimated to be between 5 and 10% of the current emissions level from manufacturing facilities on Long Island. The VOC emissions include 5.4 ton/year of methanol, which is listed as a hazardous air pollutant (section 112 of the Clean Air Act). These emissions would be minimized by the proper selection of materials and components designed for low levels of chemical leakage. In addition, vapor balancing would be installed in the trailer loading area. Also, equipment leak emissions would be monitored by a leak detection and repair program that will be proposed in the monitoring plan.

### 6.1.2 Air Quality Impact Analysis

Although dispersion modeling would likely not be required in the permitting process because the CO emissions are well below levels that would trigger a Prevention of Significant Deterioration (PSD) analysis, dispersion modeling techniques have been used to evaluate impacts from the proposed project. The ISCST model was used to predict the one-hour and eight-hour concentrations of carbon monoxide for comparison with the NAAQS.

The ISCST model dated 90436 was downloaded from EPA's electronic bulletin board service. The model was run in the rural mode and with regulatory option selected. Meteorological data collected on-site at the Kingsport facility was used with the model. Eastman measured wind speed, wind direction, temperature, and sigma theta (an estimate of wind speed changes which is used to estimate turbulence) were processed for use in dispersion models by Jim Clary and Associates of Plano, Texas. Upper air data from Nashville were used for mixing height. Hourly surface data from the Tri-City Airport were substituted as necessary for missing on-site data (less than 5% of total met data was not collected on-site).

Modeling was initiated with a 500-meter grid originating at the UTM coordinates 359000 East and 4040500 North. The grid extended 5 kilometers in the easterly and northerly directions with receptors placed at 500-meter intervals. Receptors were not placed within Eastman property boundaries.

The fugitive carbon monoxide emissions are modeled as a point source having no upward momentum and ambient temperature. Source height is assumed to be 10 feet above ground level. Emission parameters are given in Table 6.1-4.

The predicted concentrations, which are listed in Table 6.1-5, are less than 1% of the NAAQS. The maximum predicted one-hour concentration is 155 $\mu g/m^3$, which represents an increase that is very small compared with the one-hour standard of 40,000 $\mu g/m^3$. The maximum predicted eight-hour concentration increase is 25 $\mu g/m^3$, which is compared with the standard of 10,000 $\mu g/m^3$.

The predicted concentrations are added to monitored concentrations for an analysis of total air quality impact. These numbers show that the predicted maximum one-hour concentration would be 8,320 $\mu g/m^3$, and the eight-hour concentration would be 5,582 $\mu g/m^3$.

### 6.1.3 Fugitive Dust Analysis

Proposed construction activities may result in the generation of some fugitive dust. These emissions are expected to be minimal. The construction would not involve moving large quantities of earth. The site is less than an acre in size and would not require recontouring.

The site has a gravel cover and precautions would be taken to eliminate dust generation such as watering. Support caissons would be drilled and there would be shallow excavations for building foundations, but no other earth moving activities would occur.

Construction is projected to last 14 months. Post construction activities are not expected to generate fugitive dust.

**Table 6.1-4. Carbon Monoxide Source Characteristics for Dispersion Modeling Analysis**

| Source | Location | | Height m | Dia. m | Velocity m/s | Temp °F |
|---|---|---|---|---|---|---|
| | UTM-E | UTM-N | | | | |
| Fugitives | 361470 | 4042380 | 3.04 | 0.01 | 0.01 | 293 |

**Table 6.1-5. Carbon Monoxide Dispersion Modeling Results**

| Averaging Interval | Modeled Concentration μg/m$^3$ | Monitored Concentration μg/m$^3$ | Total Concentration μg/m$^3$ | NAAQS μg/m$^3$ |
|---|---|---|---|---|
| 1 hour | 155 | 8,165 | 8,320 | 40,000 |
| 8 hour | 25 | 5,557 | 5,582 | 10,000 |

## 6.2 Earth Resources

### 6.2.1 Construction Related Impacts

The proposed construction site would be a 0.6 acre plot within the existing 1,046 acre Eastman manufacturing complex. The proposed site has already been leveled, graded and backfilled with approximately six feet of compacted shale and a six-inch gravel cover. In addition, there is no vegetation on the proposed site area. Any soil disturbance during construction would be limited to drilling for caissons and shallow excavation for the building and equipment foundations. Soil from these excavations would be removed as it is produced so as to protect the existing gravel cover and to minimize the potential for soil erosion. If needed, existing storm drains would be sand-bagged to prevent sediment loss.

Since the plot is level and has a gravel cover, no other construction related impacts on physiography, geology or soils are anticipated.

### 6.2.2 Operational Impacts

Following construction activities, the operation and maintenance of the proposed project is not expected to affect any existing earth resources.

The existing gravel cover would remain and paved access roads would be constructed. Accidental discharge control would be managed through a variety of constructed features. All process areas would be built over concrete pads with curbing. The curbed areas would drain to the Eastman interceptor sewer, which transports process wastewater to an industrial wastewater treatment system.

Methanol day tanks would be placed in diked areas with a gravel cover. All oil tanks would be constructed over concrete pads in diked areas. Drainage from all diked areas would be connected to the interceptor sewer.

## 6.3 Water Resources

### 6.3.1 Construction Related Impacts

Construction of the proposed project is not expected to impact existing surface water or groundwater resources. The proposed site has already been leveled, graded and backfilled with compacted shale and a gravel cover. The potential for soil erosion and impacts on surface water would be minimized by removing cuttings from caisson excavations as they are produced and, if needed, by sand-bagging existing storm drains. The first phase of construction, following the placement of caissons, would be the pouring of concrete pads and curbing with drains to the interceptor (wastewater) sewer system. Once the pads are in place, any precipitation falling on the process, materials handling and storage areas would be collected and routed to the wastewater treatment plant by the interceptor sewer system.

### 6.3.2 Operational Impacts

Potential impacts on surface water or groundwater due to the operation of the proposed facility are related to water used for cooling, process wastewater and stormwater runoff.

# STORMWATER FLOWS LPMEOH™

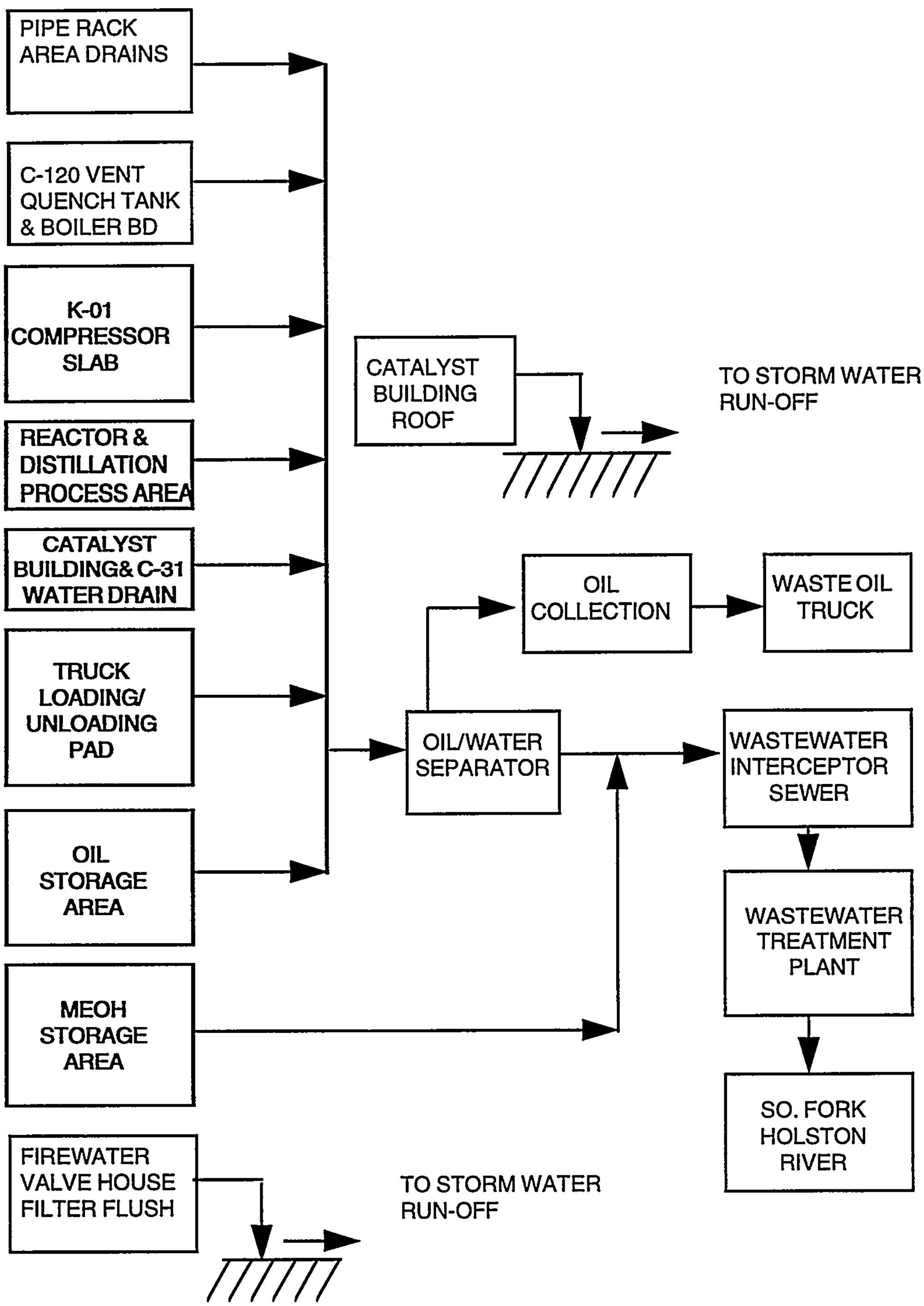


**FIGURE 6.3-1 LPMEOH STORM WATER RUN OFF** FSF 8/7/96

Stormwater runoff from the proposed demonstration unit is not expected to have any effect on surface water or groundwater resources. Runoff in areas unaffected by the manufacturing operation would be collected by an existing stormwater drainage system and routed to the South Fork Holston River. Areas potentially influenced by manufacturing would have collection systems for precipitation routed to an oil/water separator before discharge to Eastman's wastewater treatment system. These areas include process areas, the catalyst building, oil tank truck unloading pad, methanol storage area and the oil storage area. A schematic diagram of this collection system is provided in Figure 6.3-1.

The process flow diagram and integration with Eastman processes are shown in Figures 6.1-1 and 6.1-2. The underflow from 29E-20, stream 230, will be sent to the distillation system in the existing methanol process, also shown in the process flow diagram. Currently, the underflow from the existing distillation process is discharged to Eastman's wastewater treatment system. Distillation of stream 230 is expected to increase Biochemical Oxygen Demand (BOD) from this underflow by 27.2 lb/hr or 4180 lb/day and the total flow by 0.8 gpm or 0.00115 million gallons per day (MGD). Eastman's wastewater treatment system treats wastewater by neutralization, grit removal, equalization, activated sludge and final clarification prior to discharge to the South Fork Holston River. During 1993, Eastman's wastewater treatment facility operated in 100 percent compliance with a discharge permit issued by the State of Tennessee. The most recent data compilation on flow and BOD shows that on average the facility receives 23 MGD with a BOD content averaging 155,000 lb/day with a range of 82,000 to 378,000 lb/day.

The proposed demonstration unit is projected to contribute 0.42 percent of the existing average BOD load to the treatment plant and 0.005 percent of the flow. These discharges would not have any affect on the treatment plant or on the quality of its discharge to the South Fork Holston River.

Likewise, cooling water discharges from the proposed demonstration unit are expected to be small, totaling 8,000 gal/day of cooling tower blowdown or 0.002 percent of the current Eastman capacity for cooling water discharge to the South Fork Holston River. The blowdown will discharge from a permitted outfall; consequently, no adverse effect from these discharges is anticipated.

## 6.4 Management of Waste Generated

### 6.4.1 Construction Waste

The largest waste generated during construction will be miscellaneous construction debris. Although difficult to quantify and highly variable, it is estimated that 3,000 to 5,000 cubic yards of waste will be generated. This type of waste is generated managed regularly at Eastman. The primary disposal option is the non-hazardous on-site landfill (see Chapter 7 for further discussion).

### 6.4.2 Operational Wastes

Several waste streams will be generated during operation of the proposed demonstration unit.

One new liquid waste stream would be expected for the proposed demonstration unit. Miscellaneous waste oils will be managed through energy recovery in on-site boilers permitted to burn waste liquids. The primary source of waste oils is expected to be an oil/water separator. The separator is planned as a pretreatment step for stormwater runoff collected from the facility prior to discharge to the interceptor sewer. Secondary sources are oils and lubricants generated through maintenance activities. Initial estimates for this stream are 13,000 lb/yr.

An existing liquid waste stream will be increased. The existing distillation system used for further separation of stream 230 has a sidedraw used for purging of impurities. This stream is managed through energy recovery in on-site boilers. The increase in this stream is estimated to be 42.2 lb/hr or 324,000 lb/yr.

Two solid waste streams are expected for the proposed demonstration unit. The first is the spent methanol catalyst from 29T-35. This stream is a cake of the catalyst (which contains zinc, aluminum, and copper) wet with the oil used in the process. Estimates of this waste stream are currently at 68,000 lb/yr. The stream would be generated weekly, biweekly, or monthly. Management of this waste may include a number of options. Emphasis would be placed on recycling and re-use. Air Products is currently looking for a metals reclaimer to recycle the catalyst. The second and less desirable option would be incineration in Eastman's on-site incineration facility with residual ash disposal in a permitted hazardous waste disposal facility (see Chapter 7 for further discussion on these facilities).

The second solid waste stream would be activated carbon-carbonyl adsorbent from the guard beds, 29C-40A/B. This stream would be generated on a semiannual or annual frequency and is expected to be 10,000 lb/yr. If possible, the carbon would be regenerated and reused. Alternate options include disposal through incineration.

The proposed unit will be designed to produce 260 ton/day of methanol, which equals 520,000 lb/day or 166,400,000 lb/yr (assuming 320 day/yr operation). The total quantity of the wastes mentioned in this section is 416,000 lb/yr or 0.25% of the production. This is also 0.29% of the amount of wastes incinerated at Eastman in 1992. These waste streams are typical of wastes already being managed successfully at Eastman. No adverse environmental impacts would be anticipated due to the management of wastes from the proposed project.

## 6.5 Ecology

The construction and operation of the proposed project is not expected to have any impact on the local ecology. No unusual ecological resources have been identified at the project site. The proposed site, currently inside the industrial complex and idle, is filled and gravelled, with no vegetative growth. There are no state or federal threatened or endangered species known to be present at the proposed site, nor is the proposed site the habitat of any such species. The 0.6 acre parcel would be altered as a result of the development of the proposed plant, but this action should not be significant for ecological reasons.

A letter has been received from the U.S. Fish and Wildlife Service (USFWS). This letter states the USFWS anticipates no project-related adverse impacts to wetland resources or to listed or proposed threatened or endangered plant or animal species. The letter also states that the review requirements of Section 7 of the

Endangered Species Act have been fulfilled. A copy of this letter is located in Appendix V.

## 6.6 Community Resources

### 6.6.1 Land Use

The proposed project would use approximately 0.6 acre for a methanol demonstration unit. This demonstration unit would be located next to other chemical manufacturing plants, one of which is also a methanol unit. The proposed project site has been owned by Eastman since 1941 and has been prepared in anticipation of locating a chemical manufacturing plant on the site. Use of the land for the proposed project would be consistent with the surrounding Eastman facility and with its expected future use.

### 6.6.2 Zoning

The proposed project site would be located in an area which is zoned Heavy Industrial by the government of Sullivan County, TN. The portion of Eastman which lies within the Kingsport city limits is zoned General Industrial. The proposed project would not impact current zoning designations.

### 6.6.3 Socioeconomics

The capital expenditure, approximately $30 million, would be a large capital project for Eastman and would have a positive influence on the employees of Eastman and the local contract employees that work on the capital project. It is estimated that between 50 and 150 jobs (mostly local) would be required during construction and startup, and that 10 jobs would be required during operation of the facility. According to present figures, approximately $130 million would be spent during the four-year demonstration period in operating expenditures. Operating expenditures pay for items such as raw materials, utilities, catalysts, solvents, insurance, operation and maintenance labor, and replacement parts. Although difficult to quantify the benefit, this project would nonetheless have a positive effect on the maintenance and operations labor, providers of replacement parts, and suppliers of raw materials (e.g., coal from southwest Virginia and Kentucky), catalyst, and solvents. Naturally, those benefited by the project would pass those benefits on to their workers and suppliers, which in turn would have a beneficial effect on the local economy.

Another socioeconomic consideration is a movement that has recently surfaced called environmental justice or environmental equity. It is reportedly the opinion of minority groups (and under discussion at EPA) that releases of toxics tend to be concentrated in areas where poor and/or minority populations occur. Whether this theory has merit in other areas, it does not apply for Eastman or the Kingsport area. Based on income, minority population, and the stake Eastman has in Kingsport and northeast Tennessee region, concerns about environmental equity are unfounded based on Eastman's work to become a good neighbor to the citizens of Kingsport environmentally. Employees of Eastman naturally have concerns about Eastman's impacts on the surrounding community because 91% of Eastman's Kingsport-based workforce lives in Sullivan County or the counties immediately surrounding Sullivan County (Washington and Hawkins County, TN and Scott County, VA). Among the actions done by Eastman and Air Products to become better neighbors to the surrounding community are:

**1. Participation in the Chemical Manufacturers Association's Responsible Care® Program**

Each of this program's ten guiding principles help CMA's member companies to be better neighbors. The guiding principles and a copy of Eastman's 1993 Responsible Care® Progress Report and Air Products' report on environmental, health, and safety policy are included in Appendix VI.

**2. Participation in EPA's 33/50 program**

The 33/50 program is a voluntary program which participating companies commit to meet total (air, water, solid) emissions reduction goals for 17 specific compounds. Currently, Eastman is scheduled to meet the 50% reduction goal by 1995.

**3. Establishment of a Community Advisory Panel**

This panel, established in 1990 by Eastman, meets every other month to discuss Eastman's impact on the local community and Eastman's communication with the surrounding community. The panel has members of environmental/conservation groups, the business community, local government, and neighbors. Activities done at past Community Advisory Panel meetings include tours of Eastman facilities, progress reports on specific projects, and assessing Eastman communication with the surrounding community. An agenda and follow-up letter for the March 14, 1994 meeting are also included in Appendix VI.

**4. Establishment of phone number so the general public may register concerns or complaints**

The phone number, 229-CARE, was established in 1991 to provide the general public with an avenue to register complaints or ask about Eastman operations.

Phone calls received range from concerns about health, safety, and environmental issues and requests for environmental reports and tours to questions about the plants in flower beds around the plant.

**5. Monitoring of Eastman impacts on the South Fork of the Holston River**

Eastman has funded extensive river studies by the Philadelphia Academy of Natural Sciences. The latest study was completed in 1990 and results clearly show decreasing impacts from Eastman and other dischargers along the South Fork of the Holston.

Table 6.6-1 shows information comparing Sullivan County and Kingsport with the nation and Tennessee.

**Table 6.6-1. Comparison of the Nation, Tennessee, Sullivan County, and Kingsport**

| Parameter | National Average | Tennessee Average | Sullivan County | Kingsport |
|---|---|---|---|---|
| % minority in population | 19.7[1] | 17.0[1] | 2.1[2] | 5.7[2] |
| per capita income[3] | $19,091 | $16,478 | $16,583 | NA |

[1] Famighetti, 1993.

[2] Tennessee Community Data, October, 1993.

[3] Ray, 1994.

The Sullivan County and Kingsport minority population percentage is much less than the national average. Although the Sullivan County per capita income is lower than the nation's, it is slightly higher than the Tennessee state per capita income.

### 6.6.4 Transportation

Construction of the LPMEOH™ demonstration unit would require a maximum of 150 construction workers to be onsite. With over 12,000 total parking spaces at the Eastman facility and slightly over 10,000 total employees on site on a given day, parking facilities are sufficient to handle additional vehicles from these employees.

Additional workers would park on Long Island, which is served by 1.5-mile, 4-lane Jared Drive. The southeast end of Jared Drive turns into Moreland Drive, another 4-lane road, and intersects with State Road 93 (John B. Dennis Hwy.). The northwest end of Jared Drive intersects with State Road 126 (Wilcox Dr.) and Riverport Road. The Sullivan County Highway Dept. foresees no significant impacts of this additional traffic (Ref. 1).

During operation of the demonstration unit, no more than ten workers are required to operate the demonstration unit. Consequently, minimal traffic impacts would occur due to additional operations employee traffic.

Another potentially significant transportation-related impact would be the additional tanker truck traffic for shipping the product to Acurex for fuel testing. Currently, it is estimated that 400,000 gallons of product would be shipped for off-site fuel testing. This translates into approximately 70 tanker truck loads over a one-year period. Currently, the department responsible for loading the tanker trucks handles between 35 and 50 tanker truck loads each day. This additional traffic is not expected to have any significant impacts.

### 6.6.5 Noise

Increased noise would result during the construction phase from equipment, machinery, and vehicle operations. The nearest resident is about 260 feet from the proposed site and the nearest Eastman perimeter monitoring site is about 500 feet from the proposed site. During operations, the loudest known noise source would be a recycle synthesis gas compressor to be purchased with a noise specification of no more than 85 dBA at 3 feet. This would calculate to a noise level of less than 50 dBA at the nearest residence and less than 45 dBA at the perimeter monitoring site. To put this into perspective, listening to a TV 10 feet away has an equivalent sound level of 55-60 dBA. This would not add to the existing perimeter noise levels at

Eastman. Tests will be conducted and appropriate sound abaitment provided to assure the noise level specified is not exceeded.

### 6.6.6 Visual Resources

The proposed project would not impact visual resources for the following reasons:

1. Many manufacturing industries are located in the area around Eastman. Manufacturing is common to Kingsport and is not inconsistent with the surrounding area.

2. The proposed project site would occupy 0.6 acre in a 1,000+ acre manufacturing facility. Therefore, it is expected to be insignificant compared with the remainder of the Eastman facility.

3. Structures for the proposed project would be similarly designed, constructed, and equal to or smaller in size than the structures currently around the proposed site.

### 6.6.7 Cultural Resources

According to a letter from the Tennessee State Historical Commission, dated March 13, 1994, the project "...will have no effect on the characteristics of the Long Island of the Holston which qualified the property for inclusion in the National Register of Historic Places." This letter, which is evidence of compliance with Section 106 of the National Historic Preservation Act, is included in Appendix V.

## 6.7 Energy Resources

Maximum steam usage of the proposed project, expected only during startups, would be between 35,000 and 40,000 lb/hr. Given the current steam production and capacity (about 3.4 million lb/hr), this would be a relatively insignificant use of steam, and no adverse effects on the steam system are expected.

Maximum electricity usage of the proposed project would be approximately 650 KW, with the average use being one-third of the maximum. Current electricity usage at Eastman's facilities is about 200 times this maximum, so again the use would be insignificant, no adverse effects on the Eastman facility's electrical system are expected.

## 6.8 Biodiversity

Biodiversity as it pertains to environmental protection considers the value of species and genetic diversity to the well being of the planet. Loss of biological diversity is thought to be harmful not only to the planet's ecological systems but to the existence of human life and the economic systems upon which it depends.

As has been discussed in this document, the proposed project would be built on developed property within an existing manufacturing complex. The infrastructure is in place to manage by-product streams through recycling, recovery, treatment and disposal in a way that minimizes any impacts on the local environment. Local effects on air, earth and water resources are expected to be insignificant and no impacts on existing aquatic and terrestrial wildlife are anticipated. Therefore, on a local level, no impacts on biodiversity are projected.

On a more global perspective, this project would be expected to demonstrate a commercial production process for the manufacture of clean fuel for automobiles, trucks, and electric power generating plants. Successful development and use of this fuel source would result in improved air quality and could conceivably result in maintaining or improving biodiversity by making conditions more favorable for species of life adversely impacted by pollutants released during combustion of standard fuels.

## 6.9 Pollution Prevention

Pollution prevention refers to reducing emissions to the environment as well as reducing the toxicity of emissions. The hierarchy established in the Pollution Prevention Act of 1990 is first to reduce emissions at the source through process changes or material substitution. Second is to recycle or reuse potential waste streams. Once options using the first two strategies have been exhausted, the third approach is to treat the waste stream. Finally disposal of any residual is the last approach on the hierarchy.

Eastman and Air Products are members of the Chemical Manufacturers Association and have initiated the Responsible Care® program. One of the many aspects of this program is pollution prevention.

The proposed action incorporates many pollution prevention principles. Among these are as follows.

- It would demonstrate the use of methanol as a fuel. Oxygenated fuels burn cleaner, thereby reducing air emissions from mobile and stationary sources.

- Integration of the LPMEOH™ process into an IGCC plant would provide a low-NOx, low-particulate combustion turbine/generator fuel while recovering sulfur, which would normally be emitted as $SO_2$ or as a component of the waste stream of an acid gas removal system.

- The mineral oil catalyst system provides better control of catalyst temperatures. Diluting the feed gas for temperature control would not be necessary. With better temperature control, process stability would be greater, resulting in less off-spec product and lower waste production.

- Heat liberated during the reaction would be used to make steam.

- The crude methanol product after reaction and condensation will be 96 to 97 weight % methanol. This is higher than the crude methanol product at a similar point in other methanol production processes; for example, the purity in the Lurgi process averages 92%.

- Unreacted gas from the process would be used as fuel for existing boilers.

- In addition, pollution prevention opportunities would be evaluated and implemented after operation of the facility has commenced.

## 6.10 Cumulative Impacts

### 6.10.1 Short-term Use of Environment

At present the proposed project site is used for short-term storage of equipment used in the operations or maintenance activities of the surrounding manufacturing areas. However, the site has been prepared for construction of a chemical production process and would most likely be used in the future for a separate production process or for expansion of an existing process in the event the proposed project is not built. The use of this site for the proposed project is consistent with the plans for the site and with the surrounding area.

### 6.10.2 Impact on Long-term Environmental Productivity

No significant impacts from the proposed project have been found. Air emissions from the project represent only a slight increase over those from the surrounding Eastman facility, and modeled ambient concentrations are well below significance levels. In addition, air emissions will be controlled by the use of an on-site boiler for purged gas streams, an existing absorber for storage tank emissions, and a leak detection and repair program for equipment leak emissions. BOD load to the Eastman wastewater treatment facility would increase, but the facility has enough capacity to treat this additional load. Current disposal facilities are sufficient to handle solid wastes from the proposed project without significant impacts. The proposed project is not expected to have significant impacts on the surrounding area in the long-term.

The proposed project has the potential to aid in the commercialization of a methanol production process. This process could be built into an IGCC power plant and the methanol used for the production of electricity. The process could also be used to produce methanol for automobiles, trucks, buses, and other mobile sources. Methanol is a clean-burning fuel; consequently, the proposed project could have a long-term impact in the reduction of emissions from power plants and mobile sources and has the potential for significant environmental benefits.

## REFERENCES

### Section 6.1


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### Section 6.6.3


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## Section 6.6.4

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