

Monsanto

E. E. Bowles

Anniston Plant

TECHNICAL SERVICES DEPARTMENT MONTHLY REPORT

Anniston

C. K. Eastman
A. J. Koenig
J. C. Landwehr
L. J. Boesch
G. W. Miller
W. B. Papageorge
W. F. Taffee
H. L. Williams

General Offices

H. C. Carder
W. R. Robirds
D. Danna (5)
O. Hehner
B. Hodges
D. B. Hosmer (2)
W. A. Kuhn
C. F. Luecke
H. L. Payton
N. L. Sample
J. E. Smith
R. J. Stratmeyer
H. S. Trail

OTHER LOCATIONS

D. W. Jackson-WGK
T. M. Patrick-
So.2nd.St.

Summary

December, 1968

Cost Improvement Results For Twelve Months

Estimated Actual	Target	% of Target
\$36,510	\$32,100	114%
\$412,965	\$492,600	83%

Analysis: Estimated Actual Cost Improvement - 83%

Organic Division:

102% of target - 304 M actual vs. 297 M target. Major contributors included: new 6" gas line at Biphenyl 131 M vs. 40 M target and 6 M untargeted savings in Aroclor from statistical study.

Agricultural Division:

55% of target - 108 M actual vs. 195 M target. Savings on higher chlorination levels will accrue in 1970 with installation of sulfur recovery facilities. Parathion recovery savings will be realized when equipment modification are completed.

Organic Division

The Santowax R column was installed on schedule and operating as expected. Control instrumentation will be installed in February 1969 to complete this significant improvement.

Solid Aroclor yield improvement design package will be transmitted week of January 6, 1969.

Project to make Solid Aroclor in Liquid Aroclor will be transmitted week of January 6, 1969.

Plant production of Aroclor 4465 by the blending process started in December 1968.

The above projects have been expedited to meet greatly expanded 1969 Solid Aroclor demand.

COMPANY CONFIDENTIAL INFORMATION

AN-306 REV. 11/1/1968

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STLCOPCB4099085

DSW 377232

Organic Division (Continued)

CED has accepted bid on Biphenyl Hydrogen purification system for HB-40 from Chemical Design Inc. The second clave was installed and is being tested before routine operation.

Staley Grade HCl project has been given first priority in project design group. Project transmittal targeted for 2/7/69.

Agricultural Division

Sulfur Recovery project preliminary scope to be completed jointly by CED and Anniston TSD in January. Final clean-up methods indicate recovered sulfur quality better than specification grade for P₂S₅ manufacture.

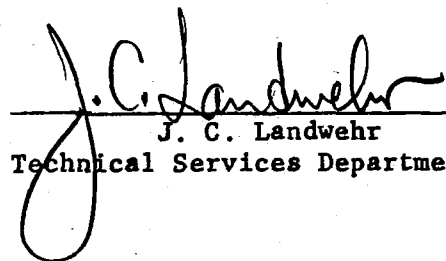
Parathion recovery expense project approved for inspecting unit to determine cause of pluggage.

Design and Drafting

Design packages for emergency radio communications and plant fire alarm system and Organic Division Safety Showers were transmitted and long delivery items were ordered. Solid Aroclor Instrumentation and Solid Aroclor in Liquid System reviews were completed and forwarded.

CED Liaison

Modifications to equipment were provided on Biphenyl and Aroclor flakers and pallet conveyors in support of start-up on Aroclor Expansion and Warehouse.


J. C. Landwehr
Technical Services Department

jw

DSW 377233

STLCOPCB4099086

240,000

1968 TSD COST IMPROVEMENT

YTD RESULTS VS ANNUAL TARGETS

200,000

100,000

160,000

80,000

120,000

60,000

80,000

40,000

40,000

20,000

0

0

PNP

NIRAN

AROCLOR

BIPHENYL

HB-40

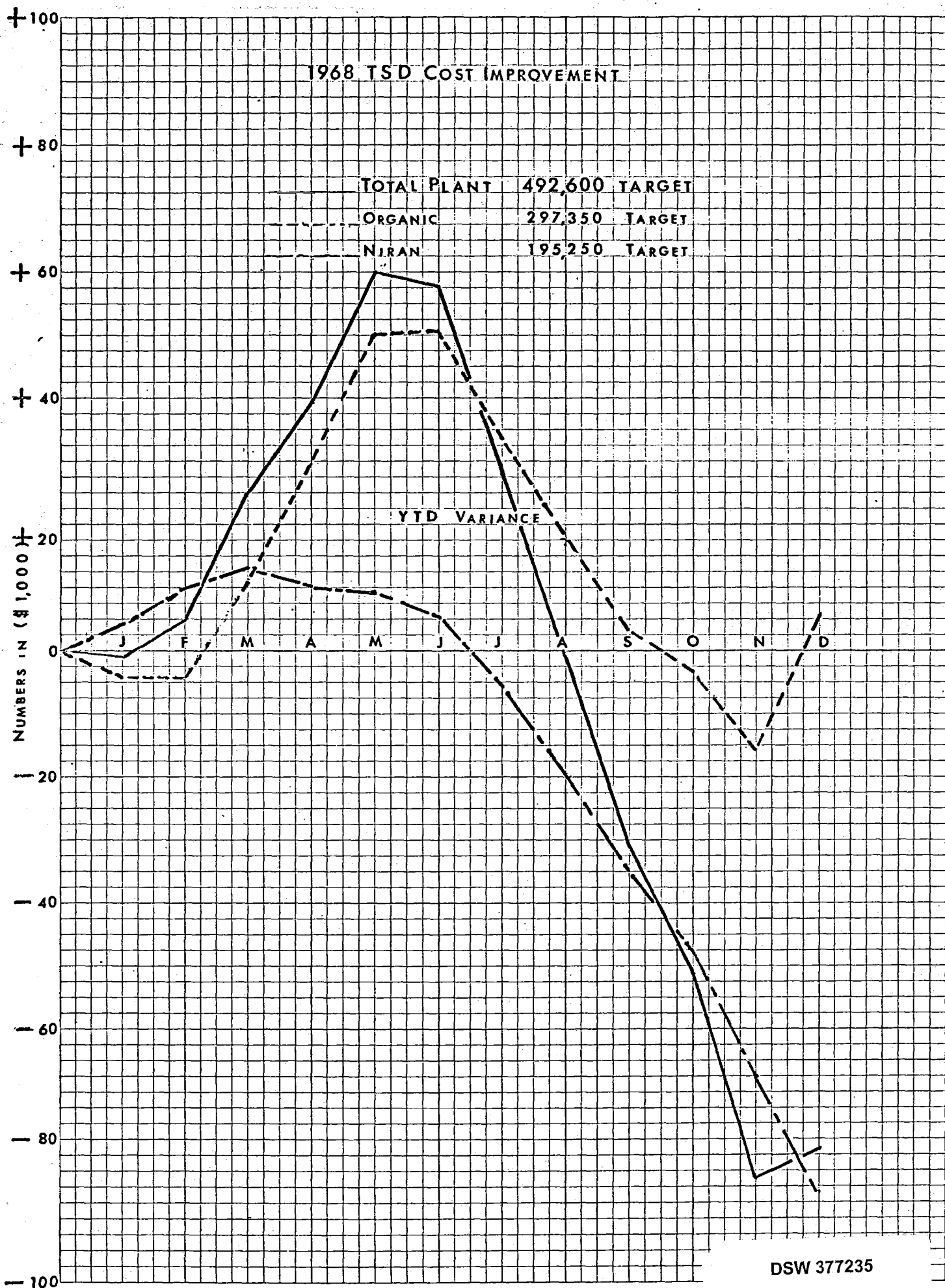
HCL

CHLORINE

DSW 377234

EUGENE DIETZGEN CO.
MADE IN U. S. A.

NO. 340-B DIETZGEN GRAPH PAPER
8 X 8 PER INCH



DSW 377235

STLCOPCB4099088

AROCLOR E. E. Bowles, C. R. McIlwain, (V. R. Haupt)

Cost Improvement

	Month	YTD
Target	\$4,910	\$58,250
Actual	\$4,335	\$46,600

Evaluate Quaterphenyl- Polyphenyl Effects on Solid Aroclor Yields	1969 Savings NFC	\$63,200 \$14,000	TSD Objective B-8 (a)
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Minor corrections to the design package remain before transmittal to Planning & Scheduling week of January 6, 1969. This project will allow increase in Solid Aroclor 5460 yield which is needed to help meet 1969's production forecast.

Make Solid Aroclor in Liquid Aroclor System	Meet 1969 Forecast	TSD Objective 1969
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Design package to allow making Solid Aroclor 5460 in the No1 Liquid Still system will be transmitted week of January 6. This is a minimum type project which adds steam tracing to chlorinator piping and ties in with the new flaking system.

Solid Aroclor 4465 by Blending	Savings NFC	\$12,000 zero	TSD Objective 1969
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First lot of 4465 by blending was shipped in December. All of 1969's production of 4465 will be made by blending.

Therminol System	Evaluation	TSD Objective 1969
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Higher priority work has delayed completion of evaluation.

Liquid Still Debottlenecking	Evaluation	TSD Objective 1969
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An evaluation of the operating capability of the Liquid Aroclor facilities remaining after the conversion of a portion of the system to Solid Aroclor is planned for first quarter 1969.

AROCLOR (Continued)

Installation of Entrainment Separator - No. 2 Liquid Aroclor Still	Capacity Increase NFC \$4,500	TSD Objective 1969 (Job 868)
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Project 3093 was approved 12/19/68. Drafting is scheduled for the second quarter 1969. Completion is now targeted for December, 1969.

Drum Flushing	Quality NFC \$60,000	TSD Objective 1969 (Job 872)
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Preliminary design and cost estimate is complete. Results will be detailed in TSD Progress Report 370:872:1 to be completed in early January, 1969. Estimated cost is \$60,000 with a yearly operating cost of \$14,000. No further work is planned on this project ~~in 1969~~ until priority has been established by the Business Group.

BIPHENYL-SANTOWAX W. G. Niemeyer, (V. R. Haupt)

Cost Improvement

	Month	YTD
Target	\$3,335	\$40,155
Actual	\$31,600	\$131,930

Debottleneck Biphenyl Stills to 87.6 M lbs/yr.	Capacity Increase	TSD Objective B-7 (a)
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CED field construction started on foundations for new Santowax C surge tank and Santowax C column feed pumps. Equipment installation scheduled for February, 1969.

No. 1 Furnace Upgrade Liaison (CEA-1892)	Capacity Increase	TSD Objective B-7 (c)
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No. 1 biphenyl furnace is running well since its start-up on November 23. A few small items need to be completed in the furnace area.

The 300,000 gallon benzene storage tank is under construction and is scheduled for completion by mid January, 1969.

Biphenyl-Santowax MIP	TSD Objective B-1 (a)
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No work this month due to installation and start-up of Santowax R column project.

BIPHENYL-SANTOWAX (Continued)

Santowax R	Quality	TSD Objective
Distillation Column		B-7 (d)

Santowax distillation area was shutdown for installation of this project at 7:00 a.m., December 17. The 8 tray column, new Montar 9 pump and related piping was installed by 3:00 p.m., December 19. The new equipment was started-up by midnight on December 19. The new Montar 9 pump is performing well. Now able to pump Montar 9 bottoms to the pit without breaking the still vacuum. The new bellows type high temperature mechanical seal installed on this pump is also performing well. After two weeks of running time, the seal shows no trace of leakage.

The quality of the Santowax R overhead product has been erratic, as expected, during the first two weeks of operation. We cannot expect consistent Santowax R quality until additional instrumentation is installed in February on Project No. 3016 to control the still. The Santowax R production rate has been sufficient to meet HB-40 and Solid Aroclor demand.

HB-40 J. L. Brown, (G. W. Miller)
V. R. Haupt

Alternate Hydrogen	Project Scope	TSD Objective
Supply		1969

Progress reports summarizing complete PR&D evaluation were issued. CED has accepted bid from Chemical Design Inc. to supply the Biphenyl Hydrogen clean-up system.

Installation of 2nd	Rate Increase	TSD Job AFE 3102
Autoclave	up to 200,000 lbs/mo.	

The second autoclave was installed at the close of December. Debugging of the system is in progress before starting routine operation of both claves.

CHLORINE D. W. Dudley (A. G. McCarty)

Cost Improvement

	Month	YTD
Target	\$1,350	\$42,770
Actual	\$ -0-	\$57,755

CHLORINE (Continued)

Reduce Mercury Usage to 0.75 lbs. Hg/Ton Cl ₂	Savings \$1,700	TSD Objective B-6 (b)
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Project to install acid wash tank for recovering mercury from "butler" is 99% complete. Wrap-up is scheduled for early January and project will be turned over to production by mid January.

Brine Dechlorination	Savings \$6,875	TSD Objective B-6 (c)
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No change in status. Waiting for maintenance to detect and repair leaks in vacuum system.

Central Chlorine Unloading	CED Liason	TSD Job 860 CEA 1831
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Scope of CEA 1831 was approved in December. Construction drawings underway. Construction scheduled to begin in early January.

HCl O. J. Norris, G. L. Moore, (A. G. McCarty)

Cost Improvement

	Month	YTD
Target	\$1,830	\$9,750
Actual	\$ 400	\$4,600

Production of Staley Grade Acid	Increased Sales And \$9,400 Savings	TSD Objective B-10 (c)
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December demand for water-white acid exceeded ability to produce. Drafting priority for coalescer project moved up in an effort to demonstrate Staley Grade Acid production as soon as possible. Transmitted data targeted for 2/7/69.

Muriatic Acid Storage	Savings \$21,200	TSD Job 497
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Foundation work completed. Tank contractor began field construction 12/30. Construction now expected to be complete by 2/1/69.

DSW 377239

STLCOPCB4099092

PNP O. J. Norris, G. L. Moore, (A. G. McCarty)

Cost Improvement

	Month	YTD
Target	\$2,500	\$119,000
Actual	0	\$ 55,100

Debottleneck to
1.8 M #/mo.

Capacity

TSD Objective
1969

Reactor recycle studies continuing. Samples show what appears to be ortho and meta nitrochlorobenzene. Definite identification requires additional lab time. Further studies in the lab and in the field are scheduled in January to determine what effects, if any, these isomers are having on the reaction rate and cool-down step.

Study of Molar
Ratio NaOH/PNCB

EVOP

TSD Objective
B-9 (c)

Tentative amendment to drop mole ratio approved in plant and now being sent to St. Louis. Tests in field should begin by mid to late January. Recent reports from W.G.K. TSD shows lowering molar ratio may increase reaction time necessary for complete conversion on PNCB. No change in tests are planned unless this rate decrease shows up in the field.

Revise MIP

TSD Objective
B-1 (g)

Plant review on rough draft scheduled for 1/9/69.

NIRAN K. G. Hale, D. W. Dudley (A. G. McCarty)

Cost Improvement

	Month	YTD
Target	\$19,325	\$195,415
Actual	0	\$108,850

NIRAN (Continued)

Demonstrate Parathion Recovery	Savings \$70,000 and 10-15% Reduced COD Loading	TSD Objective B-5 (a)
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Project No. 3106 (\$3,000 expense) was approved 12/6/68 to cover inspection of parathion coalescer for cause of pluggage. Inspection of unit is scheduled for mid January.

Parathion Formulations	Meet Budgeted Sales	TSD Job 845
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A brief evaluation of parathion formulation capability shows the existing capacity to be borderline, but adequate with close scheduling, for supplying the 1969 requirement. A debottlenecking project (\$8,000 NFC) would increase flexibility somewhat but would really do little towards improving these substandard facilities. A small productivity gain (\$3,100) can be achieved by operating the formulations plant at full capacity in 1969.

Sulfur Recovery from Residue	\$500,000/yr. Savings, 40% Reduction in SO ₂	TSD Objective B-5 (d)
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A data report with recommendations (covering the pilot centrifuge tests) will be issued by the Bird representative by 1/10/69. Completion of preliminary scope by C.E.D. and Anniston TSD is expected during 1/69.

Final clean-up methods have produced sulfur with carbon below that for P₂S₅ process specification. Process development work is near completion. Written process will be out by mid January.

Submerged Pump for RI Control of Chlorination	Savings \$1,500	TSD Objective B-5 (c)
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MRO to pull pump and inspect prior to starting tests has been issued. The inspection was requested because of the long delay when the pump was not run. It is also a safety measure to protect the glass-lined vessel.

Fume Collection System in Parathion Department	Reduce Corrosive Atmosphere	TSD Objective F-10
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Reason for fan failure appears to be combination of erosion (from sandblasting) and corrosion. Request has been sent to Division Materials Technologist for recommendations on a replacement.

DSW 377241

ENGINEERING DESIGN AND SERVICESMechanical/Electrical/Instrument Design and Drafting

J. C. Price, J. A. Veazey,
R. L. Brewer, J. K. Rennie,
V. T. Langdon, (W. F. Taffee)

Highlights

Forwarded AFE for deluge system at Niran soda ash tank, Niran cubicle sight windows, Niran agitator alarms and purchase of corrosion testing instruments. Transmitted design packages for plant fire alarm system, plant emergency radio communications and Organic Division safety showers. Design and drafting for lighting and safety chain at Niran limestone pit, Solid Aroclor instrumentation, Solid Aroclor in Liquid Aroclor system, No. 9 Aroclor chlorinator pump and PNP pump (Item 225) was completed. Assisted in start-up of Santowax R still and completed 1969 drafting and E/I design schedule.

Winterize Safety Showers

Safety

TSD Objective
A-5

Transmittal of design package for Organic Division showers in December completed this objective.

Procedure for Electrical
Testing

Safety

TSD Objective
A-6

Due to very great manpower required to develop complete program, TSD and Maintenance action was postponed until review can be carried out with S&PP as to the minimum program that will give critical protection.

Niran Interlocks

Safety

TSD Objective
A-7

AFE forwarded for review. Design scheduled for completion in December, 1969.

Photograph Drawings

Security

TSD Objective
D-1

Cost of photographing drawings was prohibitive and no further action was taken.

TSD Guideline for
Transmittal of Design
Information

Function

TSD Objective
D-4

No action during 1968.

DSW 377242

STLCOPCB4099095

UTILITIES ENGINEERING J. C. Price, L. O. Chambers (W. F. Taffee)

Rough drafts of progress reports on Plant Power Factor Improvement and Plant Central Compressed Air System were completed. Completed final design on Biphenyl Gas Meter and Cooling Water on Trane Compressor projects and forwarded for drafting. Completed first quarter 1969 work plan.

PLANT IMPROVEMENT G. C. Goodwin (W. F. Taffee)

AFE's for all remaining 1968 program projects have been forwarded for approval.

Report on 1968 program will be completed by 1/15/69.

Proposed final scope of 1969 program was completed.

POLLUTION CONTROL E. G. Wright (W. F. Taffee)

Reporting Spills and Other Non-Routine Operating Conditions in the Plant	Pollution Abatement	TSD Objective F-4
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Five air pollution complaints were reported by plant personnel during December. Three were due to SO₂, one due to H₂S and one due to Cl₂ fumes.

Install Solids Removal Equipment at Waste Treatment Plant	Pollution Abatement	TSD Job 808
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Firm bids have been received from electrical and piping contractors. Project revision is being prepared.

Contacts with Regulatory Agencies	Community & Govt. Relations	TSD Objective F-2
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Toured city treatment plant and introduced Lloyd Boesch, new Agricultural Superintendent, to Bob Hendrick, the supervisor of the city plant.

Air Sampling Program	Pollution Abatement	Pollution Control Obj. F-3
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Arranged for a low cost automatic SO₂ analyzer to be used on a trial basis. Analyzer was put into operation.

POLLUTION CONTROL (Continued)

Waste Treatment

All wastes were effectively treated during December. Average daily values for Monsanto's effluent are as follows:

	<u>Average Daily</u>	<u>Specifications</u>
PNP	1 ppm	5.0
COD	62 ppm	<200
Parathion	0.09 ppm	1.0
BOD	3 ppm	<200

PROCESS AND QUALITY ANALYSIS

W. B. Dunlap

P₂S₅ Parathion Correlation
Study

Potential
\$50,000 Savings

TSD Job 827

A monitor system was set up to provide a long-term correlation of distilled intermediate quality with parathion quality. Routine GLC analyses will measure isomers in parathion, and in distilled intermediate with extreme assays.

Solid Aroclor
Statistical Control

\$23,000 Savings

TSD Job 831

A study of yield information based on existing inventory methods showed a high variability which obscures cost sheet verification of process improvement. Precise judgment on cost improvement requires reduction of this error.

Quality

The RFT Index was 98.7 with 8 lots rejected out of 604; 5 out of 511 from the Organic Division. The Plant Quality Score was 94.5, up 4.0 from November, with YTD score of 95.0 against a target 93.0 minimum.

DSW 377244

STLCOPCB4099097

PLANT LABORATORIES G. W. MillerPROCESS RESEARCH AND DEVELOPMENT J. T. BellHB-40 Biphenyl Hydrogen Purification J. L. Brown

1. The PR&D effort directed toward purification of biphenyl hydrogen by use of the Solid Bed Heatless Adsorption Pilot Unit has essentially been completed. Reports No. 3 and 4 (Anniston 370:861) have been issued with results of the comprehensive evaluation.
2. The pilot unit will be disassembled and returned to Chemical Design Inc. by 1-10-69.

p-Nitrophenol J. L. Brown

1. A preliminary study into the chemical and/or physical causes of irregular cooling periods in PNP reaction cycles has been initiated. A comprehensive investigation is scheduled to begin 1-23-69.
2. Samples from the PNP 260 tank (reactor let-down collection tank) have been analyzed but a correlation between the composition of the tank contents and cooling period has not been established. The samples have varied in composition from the nitrochlorobenzenes to sodium PNP. The ortho and meta isomers of chlorobenzene have been established as present in varying amounts in some samples.

Parathion Emulsifiable Concentrates J. L. Brown

A procedure was developed to upgrade deteriorated lots of Methyl M-4 emulsifiable concentrates. The material will be reformulated for export sales based on this information.

Aroclor 1272 G. L. Arnett

1. The preparation of 30 lbs. of Aroclor 1272 for customer evaluation is approximately 50% completed. The material is being prepared by chlorination of Aroclor 1268 catalyzed by iron turnings followed by distillation.
2. The chlorinated product prior to distillation is low in color. As a result of the low color, this material will be investigated as a substitute for the distilled product.

Aroclor 5460 Expansion G. L. Arnett

Viscosity and specific gravity data on Aroclors 5060 and 5460 were obtained at various temperatures to assist TSD-CED in design of an expanded Aroclor 5460 system.

PROCESS RESEARCH AND DEVELOPMENT (continued)

Sulfur Recovery I. Ransaw, W. H. Howard

1. The process for the refinement of sulfur residues consists of alternate caustic and water washings, followed by steam sparging and a filtration. By this procedure, samples were consistently refined to meet the specifications of maximum organics, acidity, and ash.
2. The optimum NaOH concentration in the wash step has been established as 0.4%, below which higher residual organic levels were observed yet no improvement was found above this concentration. Samples with initial organic levels of between 8 and 19% were refined to meet specification by this procedure.
3. A tentative PR&D Process Report has been prepared and will be issued by 1-10-69.

Aroclor 1242 G. L. Arnett

Aroclor 1242 produced by the continuous system at WGK was analyzed by differential infrared analysis. The material is very similar to the Anniston produced Aroclor 1242.

ANALYTICAL AND QUALITY CONTROL S. O. Kemp

Complaint Report

Quality

<u>Number</u>	<u>Material</u>	<u>Customer</u>	<u>Reason</u>
9-A-68	Aroclor 5442 Aroclor 1254	Products Research	Color Viscosity

YTD Quality Complaints/100 Shipments 0.11 : Target 0.20

Service

<u>Number</u>	<u>Material</u>	<u>Customer</u>	<u>Reason</u>
13-S-68	Aroclor 1242	Sangamo Electric	Short Weight
14-A-68	Aroclor-HB-40	Dixie Solvents	Failure to follow SSI

YTD Service Complaints/100 Shipments 0.17 : Target 0.20

COMMUNITY RELATIONS, PERSONNEL, RECRUITING, AND DEVELOPMENT

Personnel

1. J. M. Jones and L. O. Chambers returned to Ga. Tech. and Auburn after co-op work quarter.
2. G. L. Moore and J. McGee reported for quarter work session.
3. PR&D expended 13 mandays (G. L. Arnett) to assist the Niran department in correcting an ethyl parathion spill in the S.S. Maltesholm.

Recruiting

1. For the year 1968 had 3 acceptances of technical offers out of eight offers made, 3 offers are pending on personnel available in 1st or 2nd quarter of 1969, and 2 offers were declined. (TSD Objective E-1, Hire at least 50% of all qualified personnel to whom offers are made.)

Development

1. S. O. Kemp was promoted to Analytical Supervisor, G. L. Arnett was promoted to Research Chemist, and W. B. Dunlap was promoted and given expanded responsibility as Supervisor, Process and Quality Analysis. These promotions become effective 1/1/69.
2. Pilot course in Process Dynamics and Control which was taught by Dr. Z. L. Taylor of Auburn University over leased telephone (VERB) equipment was concluded. The course made possible evaluation of this method of continuing education, and a survey of the students is underway to this end. One co-op student, John Jones, will receive degree credit from Georgia Tech based on his participation. (TSD Objectives E-4, Liason with higher technical institutions and E-5, Development of Technical Personnel.)
3. J. C. Price attended "Management Process" course in St. Louis the week of 12/8/68. (TSD Objective E-3, Develop personal development goals for each Dept. member and review quarterly for results.)

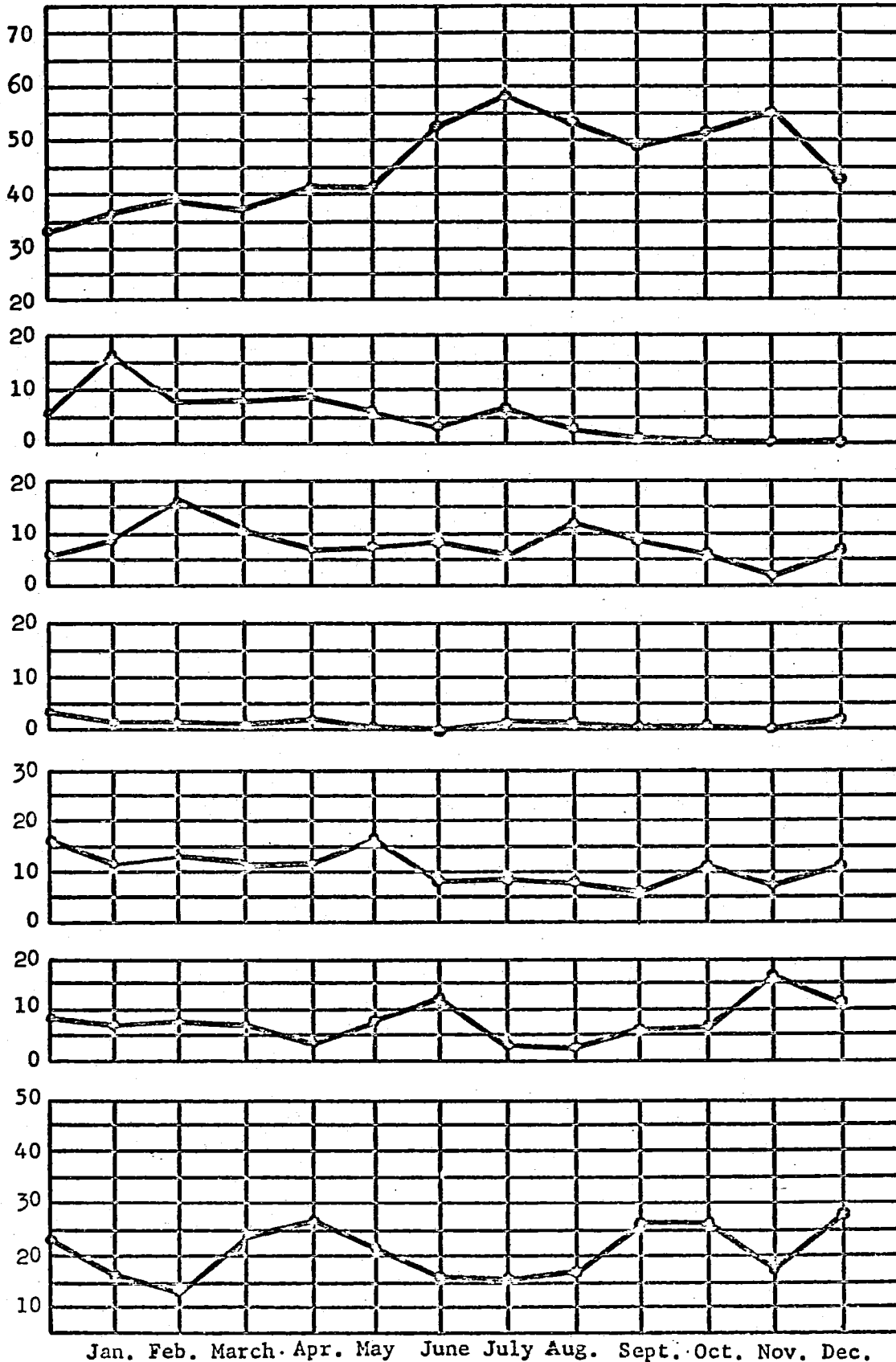
Visitors

1. R. G. Corley from CED here 19 December to discuss Solid Aroclor expansion concerning control room.
2. R. M. Kountz and R. S. Yates here 4-5 December on scope of Solid Aroclor expansion.
3. J. R. Ryland visited concerning Bulk Chlorine Handling Project.

DSW 377247

DISTRIBUTION OF TIME BY TECHNICAL SERVICE

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

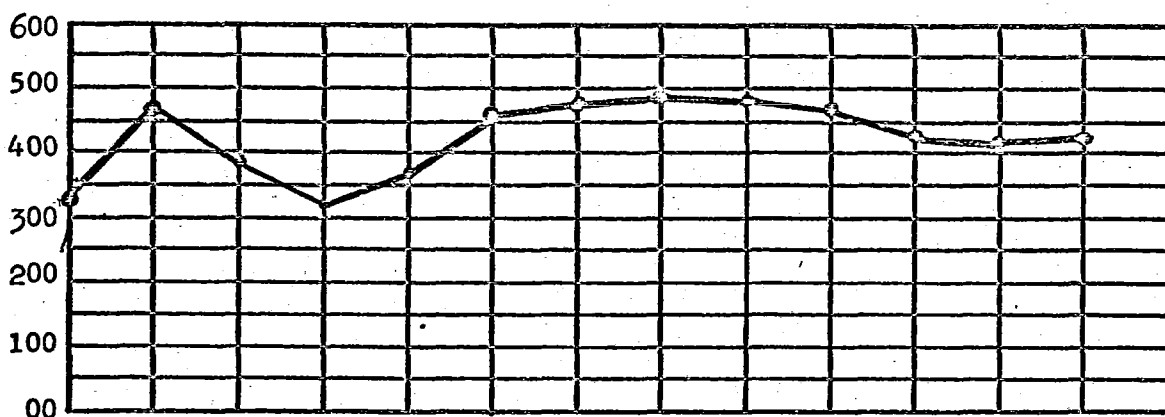


DSW 377248

STLCOPCB4099101

TSD PROJECT SUMMARY

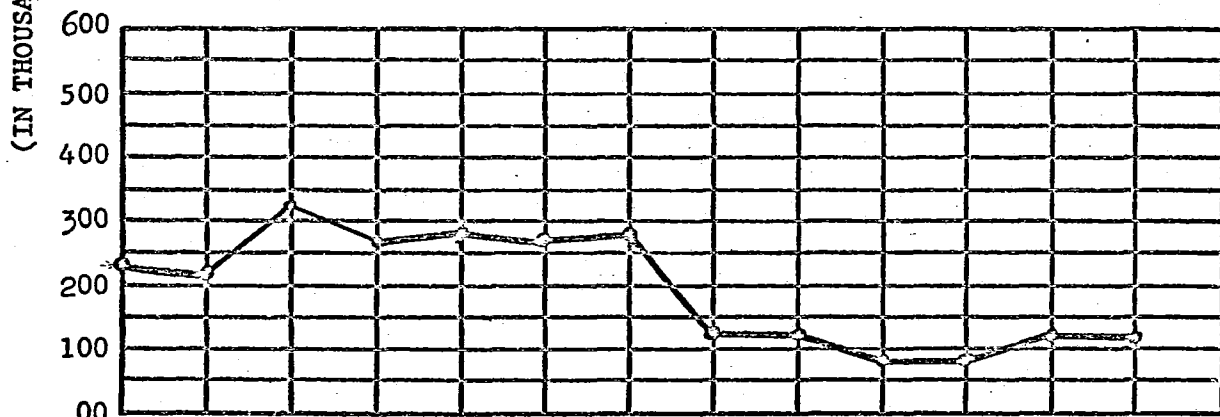
IN
MAINTENANCE
FOR
CONSTRUCTION



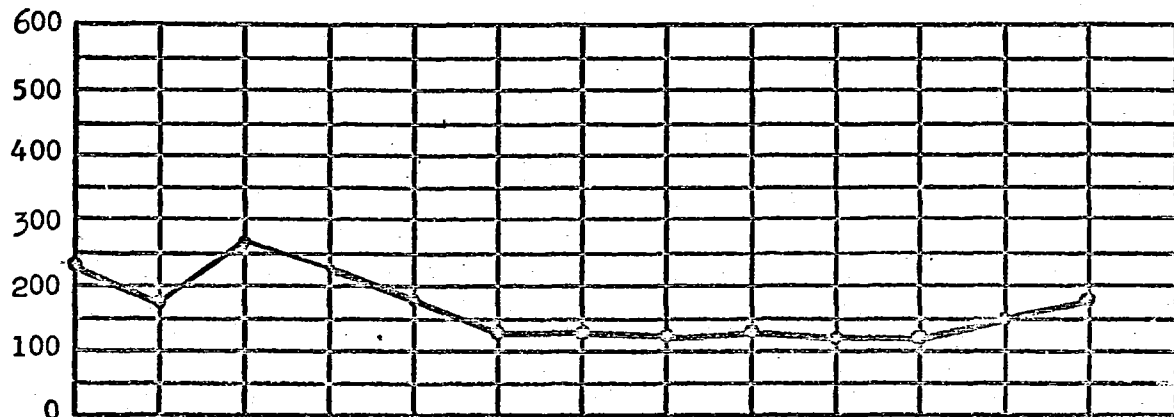
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PROJECTS
SUBMITTED
FOR
APPROVAL

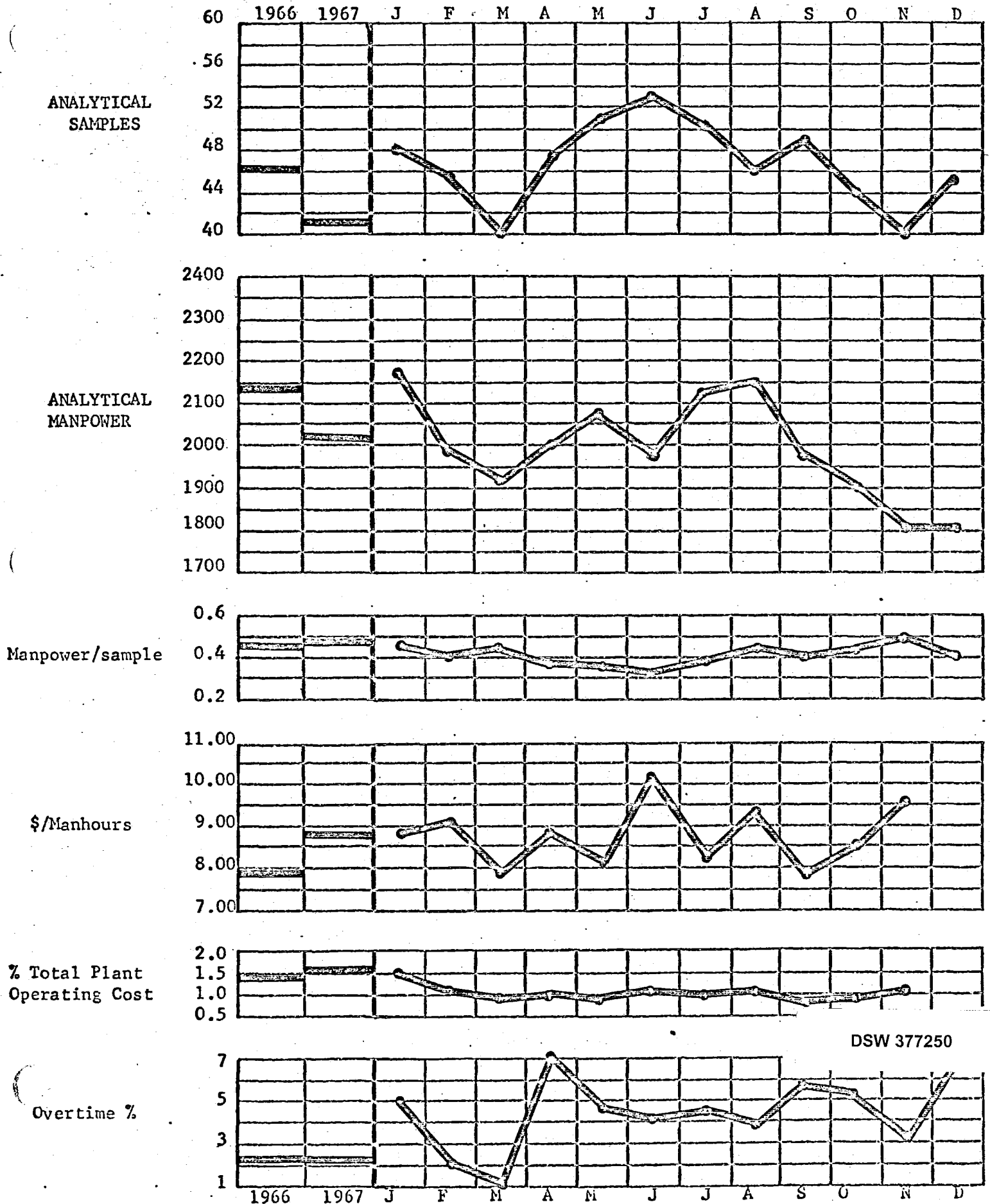


APPROVED
PROJECTS
IN TSD



Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan.

LABORATORY ADMINISTRATION



DSW 377250