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TECHNICAL REPORT STANDARD TITLE PAGE

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4. TITLE AND SUBTITLE USER MANUAL AIR QUALITY DATA HANDLING SYSTEM		5. REPORT DATE November 1977 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Jim Faulkinbury and Paul Benson		8. PERFORMING ORGANIZATION REPORT NO 19701-657288
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Transportation Laboratory California Department of Transportation Sacramento, California 95819		10. WORK UNIT NO 11. CONTRACT OR GRANT NO.
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15. SUPPLEMENTARY NOTES
This report covers the work done under the research project titled "Specialized Retrieval Program for the Air Quality Data Handling System (AQDHS)".

16. ABSTRACT
The Air Quality Data Handling System (AQDHS) has been modified from the form provided by EPA which was designated AQDHS1. The new version of the system utilizes direct access processing under the Virtual Storage Access Method (VSAM) for streamlined processing. All features of AQDHS1 have been incorporated maintaining the input formats which were used in that system. Additional features of this improved system permit the input of negative numbers into the data base, a capability which AQDHS1 lacked. An additional Data Report Program which selectively provides multiple parameters, either stored or newly created, by hour, has also been included.

17. KEY WORDS Air Quality Data Virtual Storage Access Method, Data Handling System, Data Report Program, selective capability, multiple parameters.		18. DISTRIBUTION STATEMENT No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161.	
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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF CONSTRUCTION
OFFICE OF TRANSPORTATION LABORATORY

November 1977

TL No. 657288

Mr. C. E. Forbes
Chief Engineer

Dear Sir:

I have approved and now submit for your information this final research project report titled:

USER MANUAL
AIR QUALITY DATA HANDLING SYSTEM (AQDHS)

Study made by . . . . . Enviro-Chemical Branch and Office of Computer Systems

Under the Supervision of . . . . . E. C. Shirley, P.E. and C. R. Sundquist, P.E.

Principal Investigator . . . . . P. E. Benson, P.E.

Co-Principal Investigator . . . . . J. Faulkinbury

Report Prepared by . . . . . J. Faulkinbury

Very truly yours,

George A. Hill

GEORGE A. HILL
Chief, Office of Transportation Laboratory

Attachment

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ACKNOWLEDGEMENTS

This project was a joint effort between the Office of Computer Systems and the Air Quality Section of the Transportation Laboratory. The review of the report by Mr. Bennett T. Squires is appreciated.

The contents of this report reflect the views of the Transportation Laboratory, which is responsible for the interpretation of facts and the accuracy of the information presented herein. The contents do not necessarily reflect the official views of the State of California. This report does not constitute a standard, specification or regulation.

The State of California does not endorse products or manufacturers. Trade or manufacturer's names appear herein soley because they are considered essential to the object of this document.

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I. PURPOSE OF THE SYSTEM

The AQDHS or Air Quality Data Handling System is also known as the SAROAD (Storage and Retrieval of Aerometric Data) system.

The SAROAD System is capable of storing, retrieving, and processing air quality and meteorological data. The system consists of computer programs to create, update, and maintain the SAROAD master file. Computer programs are also available for special purposes such as analyzing and summarizing the data.

A list of valid Area Codes can be found in the SAROAD Station Coding Manual.

Valid Parameter, Method, and Units Codes are listed in the Air Quality Data Handling System Users Manual (EPA APTD-1086).

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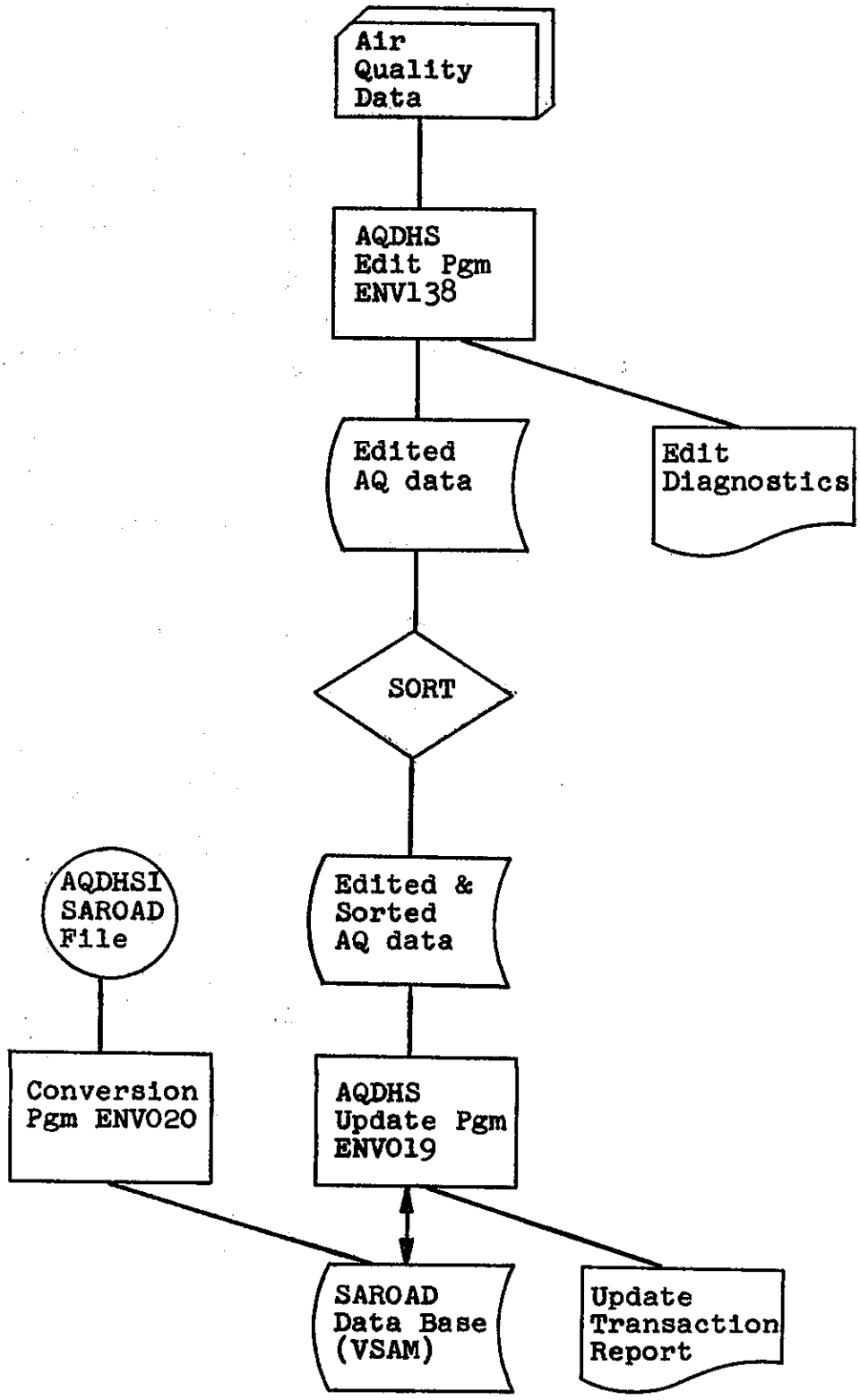
SYSTEM FLOW CHART AIR QUALITY DATA HANDLING SYSTEM



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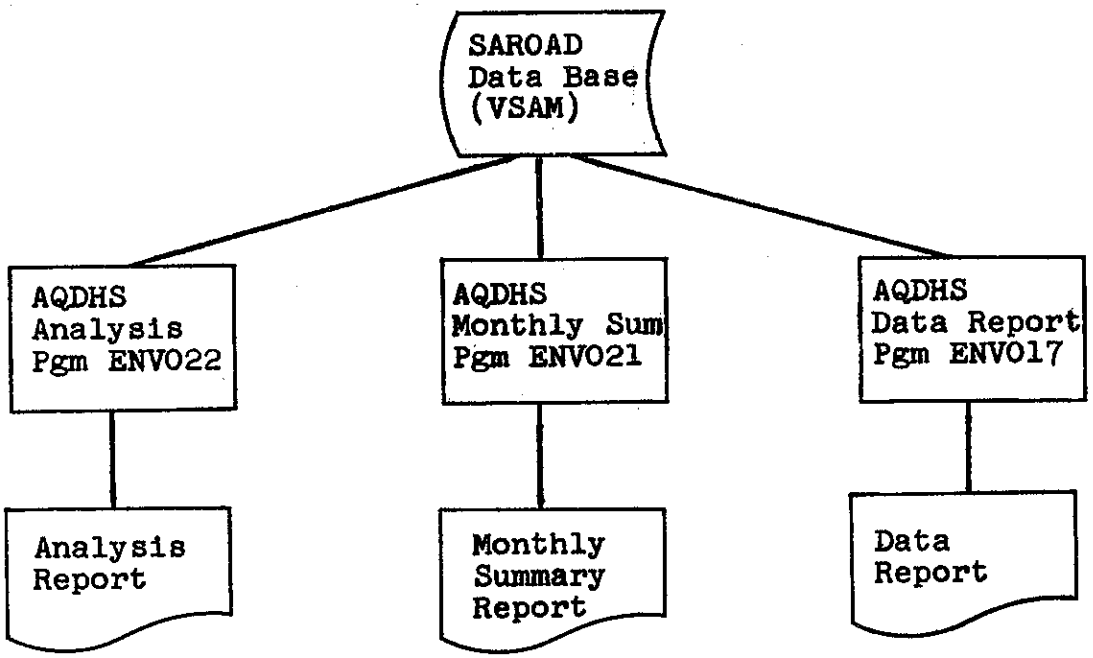

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II. EDIT PROGRAM

A. Identification

ENV138: AQDHS Edit Input Data
System: Environmental (ENV)
User Contact: Ben Squires, CALTRANS Transportation Lab(ATSS 8-432-4824)
OCS Contact: Jim Faulkinbury, Office of Computer Systems
Language: COBOL on IBM 370/168 (ATSS 8-432-4856)

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B. Restrictions and/or Limitations

1. The current revision of the update program, ENV019, limits the data input to hourly data.

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C. Program Description

Program ENV138 is an edit program which reads the input data deck to create or update the AQDHS master file. The program edits each input card for proper parameters. The program prints out diagnostics for all data cards which for various reasons were rejected and could not be used to create or update the master file.

The diagnostic output from program ENV138 comprises a thorough validation check of the data submitted as input. If an air quality data card or card image does not pass all validation checks, no data on that card or card image are processed. The error on the card or tape must be corrected, and the corrected card must be input during a subsequent update run. The specific check features now in the system, with attendant error messages are given under "Error Messages". Appendix 1 contains a sample of the actual printer listings for data cards which did not pass one or more of the defined validation checks.

The input consists of the action cards and the update data cards.

1. ACTION CARDS - Three types: delete, add or change

An action card is an 80-column card which has only two column entries, a dollar sign in column 1, and an action code in column 2. The action code is a one-digit number, for delete, for add, or for change. The action card is inserted in front of the air quality data card, or group of cards, to which it refers. The action code remains the same for all following cards, until the program encounters another action card.

2. DATA CARDS

The update data cards contain the identification for the site and pollutant followed by 12 hours of data for the record. A 24 hour day requires 2 data cards.

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D. Input

Input to ENV138 consists of card or card image input only. Two card formats exist under current constraints which permit only hourly AQDHS data cards.

1. Action Cards

Col.	Field	Description
1	"$"	Designates action card
2	Transaction Code	1 = delete 2 = add 3 = change

2. Data Cards

Col.	Field	Description
1	Form Code	Always 1
2-3	State Code	Always 05
4-7	Area Code	
8-10	Site Code	
11	Agency Code	Always F
12-13	Project Code	
14	Time Code	Must be 1 for hourly data
15-16	Year Code	
17-18	Month Code	Must be in range 1 to 12
19-20	Day Code	Must be in range 1 to 31
21-22	Start Hour	Either ØØ or 12
23-27	Parameter Code	
28-29	Methods Code	
30-31	Units Code	
32	Decimal Code	0 to 4 representing the number of digits in the data field to the right of the decimal point.
33-36 37-40 77-80	Data	Twelve digit data fields right justified and zero filled.

DDNAME: DDX DD *

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E. Output

The output of ENV138 is a temporary file of update records for input in the update program ENV019 and a printed report of edit diagnostics of the input data cards if any.

1. ENV138 Temporary File Output

This file consists of 81 byte records in the proper format to update the AQDHS master file in program ENV019. The record format is as follows:

Col.	Field	Description
1	Form Code	"1"
2	Action Code	1,2, or 3 for delete, add, change
3	Agency Code	"F"
4-5	Project Code	
6-7	State Code	"Ø5"
8-11	Area Code	
12-14	Site Code	
15-19	Parameter Code	
20-21	Methods Code	
22-23	Units Code	
24	Time Code	
25-26	Start Hour	"ØØ" or "12"
27-28	Year Code	
29-30	Month Code	In range of 1-12
31-32	Day Code	In range of 1-31
33	Decimal Code	0 to 4
34-81	Data	12 four byte fields

DDNAME: DD3

DCB Parameters:

DCB = (RECFM=FB, LRECL=81, BLKSIZE=810)

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2. Print File

This error listing is printed only if edit diagnostics are produced by erroneous data. A sample printout is located in the appendix. A listing of the possible error messages is located in the processing instructions.

DDNAME: DD2 DD SYSOUT=A

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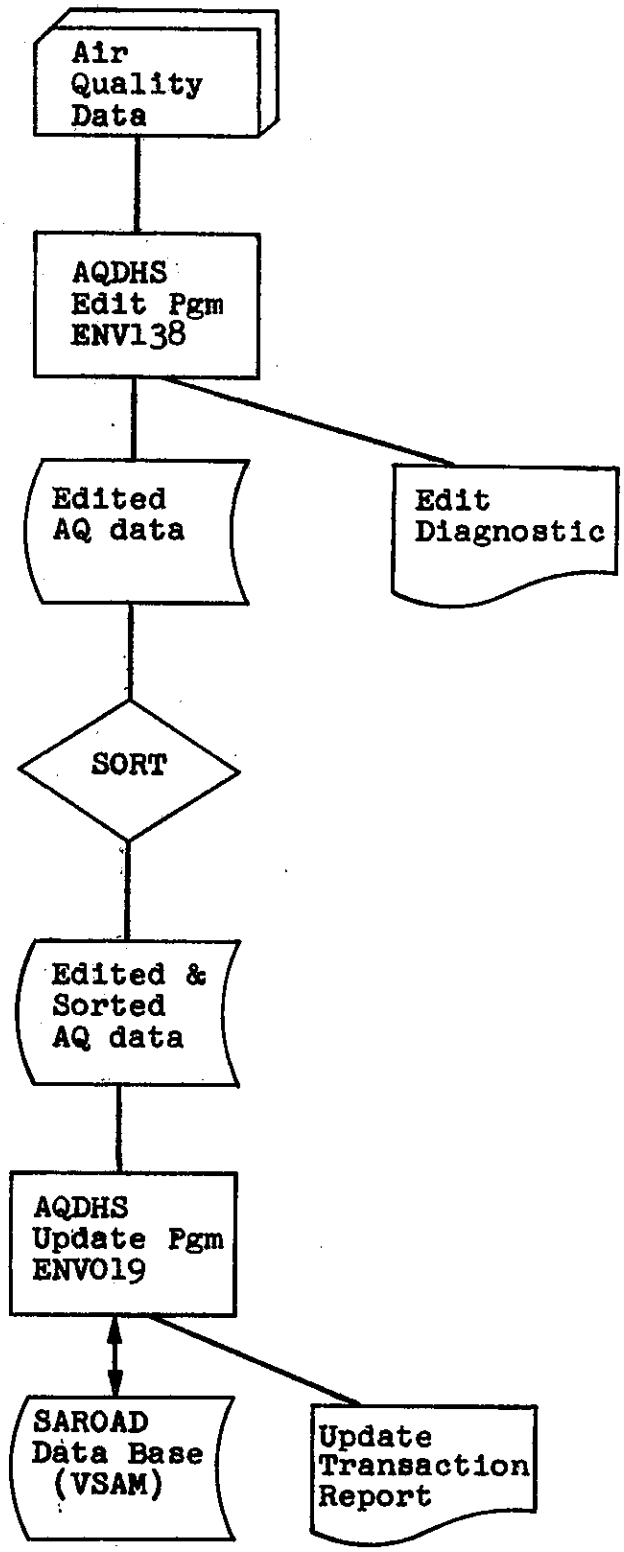
F. Processing Instructions

1. I/O Flow Chart



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2. Required Resources

a. This program requires 34K of memory for execution.

b. The number of lines output is a direct function of the number of edit errors found. The default value for lines should be more than sufficient for execution.

c. CPU time for this program is nominal. 300 input records can be processed in less than 1 CPU second.

d. Error Messages

The following edit diagnostics are produced by this program:

Type of Error	Message Printed Out	Action
Blank card	BLANK CARD	Card ignored
Blank data field	CARD CONTAINS NO DATA	Card ignored
Embedded blanks in data field	EMBEDDED BLANKS IN DATA FIELD	Card not processed
Form 0 or blank	NO SAROAD FORM CODE	Card not processed
Form code not=1	ILLEGAL SAROAD FORM CODE	Card not processed
State code 0 or state code >60	ILLEGAL STATE CODE	Card not processed
Form code 1 with time code other than 1	TIME CODE NOT USED FOR AQDHS	Card not processed
Time code 1 with start-hour other than 0 or 12	START-HOUR INCOMPATIBLE WITH TIME CODE	Card not processed

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Type of Error	Message Printed Out	Action
Year code not 60 to 80	ILLEGAL DATA CODE (YEAR)	Card not processed
Month code not 1 to 12	ILLEGAL DATA CODE (MONTH)	Card not processed
Day code not 1 to 31	ILLEGAL DATA CODE (DAY)	Card not processed
Decimal code not 0 to 4	ILLEGAL DECIMAL CODE	Card not processed
Action code not 1 to 3	ILLEGAL ACTION CODE	Program terminated
Any embedded blank	EMBEDDED BLANKS OR ILLEGAL CHARACTERS IN CARD FIELD	Card not processed
Alphabetic or other non-numeric character (except agency code)	EMBEDDED BLANKS OR ILLEGAL CHARACTERS IN CARD FIELD	Card not processed

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APPENDIX 1

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Requirements for Data Guidance

Program Number ENV138 Name Edit Program AQDHS Section Name Air Quality

Application System Environmental(ENV

Date 14 Oct., 1977

Status of this release:

● New ○ Modification

- ● System Flow Chart
- ○ Programming Assignment Sheet
- ● Formats
- ● Description of Data Control Cards
- ● Halts and Messages
- ○ Balancing and Controls
- ● Sample JCL
- ○ Hardware/Software Requirements

Location:

DSNAME TM.ENV.LOADLIB

Volume SYS003 Expiration Date

Input Files:

	DDNAME	BLOCK SIZE	DSNAME	ORIGIN*	MAXIMUM FILE SIZE	FILE RETENTION
1.	DDX	80/80	Card input			
2.						
3.						
4.						
5.						

Output Files:

	DDNAME	BLOCK SIZE	DSNAME	DESTINATION*	MAXIMUM FILE SIZE	FILE RETENTION
1.	DD2	133/133	Print file			
2.	DD3	81/810	SYSDA	Input to ENV019 (after sort)		
3.						
4.						
5.						
6.						
7.						
8.						

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*Document, Program, or Department. Specify "plotter" if applicable.

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Requirements for Data Guidance (Program Number ENV138) Date 14 Oct., 1977

Output Distribution Requirements:

- ○ Run on standard 1-part paper (Form No. 13158.16)
- ● Run on Form No. _____, ___-part paper

As requested

Copies will be distributed to:

Sorts:

Output file DD3 must be sorted prior to input into ENV019

SORT FIELDS=(3,14,A,24,1,A,27,7,A,25,2,A),FORMAT=CH TR.SORTCARD(ENG138S2)

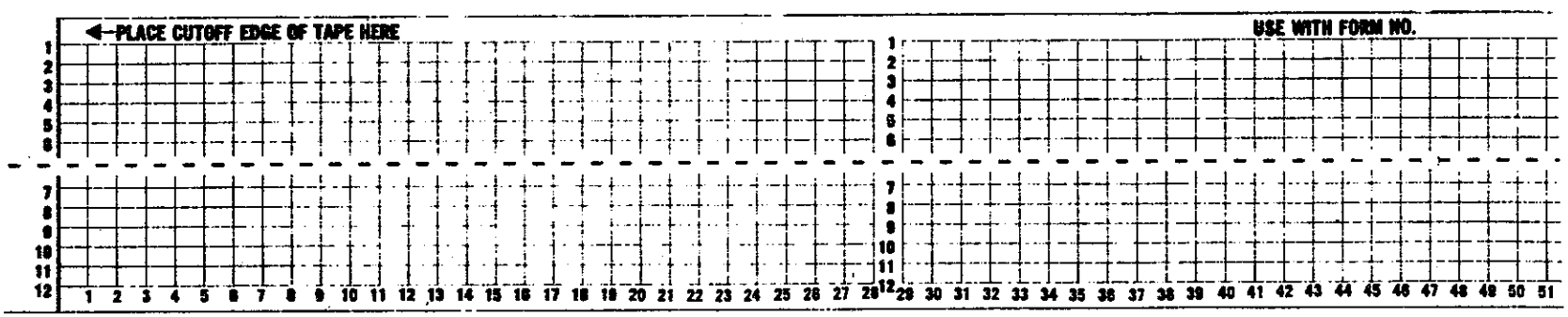
15

Frequency:

- ○ One time only
- ○ Daily
- ○ Semi-weekly
- ○ Weekly
- ○ Semi-monthly
- ○ Monthly
- ○ Quarterly
- ○ Semi-annually
- ○ Annually
- ● On request
- ○ Other _____

Carriage Control Tape:

- ● Standard
- ○ As Shown



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Sample JCL ENV138 & ENV019

```
//T_ENV___ JOB (T_100P,____,_____,____L),name,CLASS=_,REGION=190K
//EDIT    EXEC  PGM=ENV138
//STEPLIB  DD   DSN=TM.ENV.LOADLIB,DISP=SHR
//DDX      DD   *
     Input data cards or card image records
//DD3      DD   UNIT=SYSDA,DISP=(,PASS),SPACE=(CYL,(1,1)),
//              DCB=(RECFM=FB,LRECL=81,BLKSIZE=810)
//DD2      DD   SYSOUT=A
/*
//SORT    EXEC  PGM=IGHRC000,PARM='CORE=038000,MSG=AP',REGION=64K
//SORTLIB  DD   DSN=SYS1.SORTLIB,DISP=SHR
//SYSOUT   DD   SYSOUT=A
//SORTWK01 DD   UNIT=(SORTDA,3),SPACE=(CYL,(2),,CONTIG)
//SORTWK02 DD   UNIT=(SORTDA,3),SPACE=(CYL,(2),,CONTIG)
//SORTWK03 DD   UNIT=(SORTDA,3),SPACE=(CYL,(2),,CONTIG)
//SORTIN   DD   DSN=*.EDIT.DD3,DISP=(OLD,DELETE),
//              DCB=(RECFM=FB,LRECL=81,BLKSIZE=810)
//SYSIN    DD   DSN=TR.SORTCARD(ENG138S2),DISP=SHR
/*
//UPDT    EXEC  PGM=ENV019
//STEPCAT  DD   DSN=TRUCAT01,DISP=SHR
//STEPLIB  DD   DSN=TM.ENV.LOADLIB,DISP=SHR
//         DD   DSN=SYS2.PLILIB,DISP=SHR
//REPORT   DD   SYSOUT=A
//SYSPRINT DD   SYSOUT=A
//AQDHSI   DD   DSN=TRUCAT01.T_.----------------,DISP=SHR,
//              AMP=AMORG,VOL=SER=_____,UNIT=3330-1
//CARDIN   DD   DSN=*.SORT.SORTOUT,DISP=(OLD,DELETE)
/*
```


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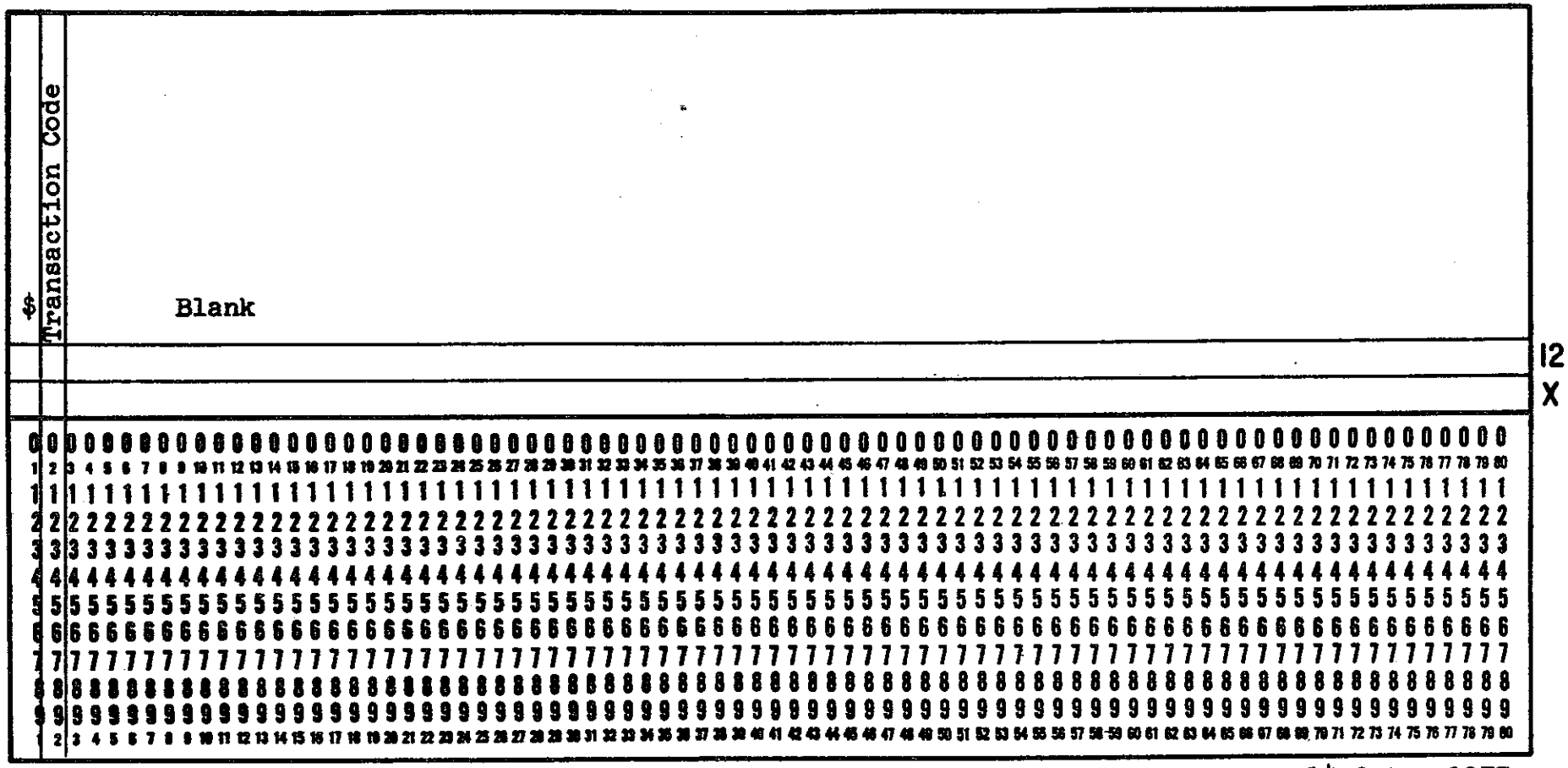
RIGHT
LEFT

ENV138 AQDHS Action Card



Transaction Codes: 1 - Delete
2 - Add
3 - Change

14 Oct., 1977
JWF

RIGHT
LEFT

ENV138 AQDHS Data Card

Form Code	State Code	Area Code	Site Code	Agency Code	Project Code	Time Code	Year Code	Month Code	Day Code	Start Hour	Parameter Code	Methods Code	Units Code	Decimal Code	Hourly Data											
															Hour 0 or 12	Hour 1 or 13	Hour 2 or 14	Hour 3 or 15	Hour 4 or 16	Hour 5 or 17	Hour 6 or 18	Hour 7 or 19	Hour 8 or 20	Hour 9 or 21	Hour 10 or 22	Hour 11 or 23
12																										12
X	1	05			F																					X

14 Oct., 1977
JWF

Note: State Code for California is 05
Agency Code for State Agency (DOT) is F

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FORMAT DESCRIPTION

ENV138 AQDHS Edit Program

PROGRAM ORIGINATING FORMAT (NUMBER, FILE CODE, AND NAME)

DATE	ORIGINATOR	REVIEWER
14 Oct	77 JWF	

FILE NAME Temporary file to ENV019 FORMAT TITLE

Form Code	Action Code	Agency Code	Project Code	State Code	Area Code	Site Code	Parameter Code	Methods Code	Units Code	Time Code	Start Hour	Year	Month	Day	Dec. Code	Hourly Data: Hour 0 or 12	Hour 1 or 13	Hour 2 or 14	Hour 3 or 15

Hourly Data: Hour 4 or 16	Hour 5 or 17	Hour 6 or 18	Hour 7 or 19	Hour 8 or 20	Hour 9 or 21	Hour 10 or 22	Hour 11 or 23	EOR

MODE:
BINARY–B
PACKED–P

LABELS:
STANDARD ■
NON-STANDARD ☐
NO LABELS ☐

RECORD FORMAT:
FIXED–F ■
VARIABLE–V ☐
UNDEFINED–U ☐

RECORD LENGTH 81
RECORDS PER BLOCK 10
BLOCK SIZE 810

INPUT ☐
OUTPUT ■

PAGE ___ OF ___

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Sample Diagnostic Report Listing - ENV138

```
***** EDIT-DIAGNOSTICS FOR AQDHS INPUT DATA CARDS *****

*** CARD (FORMAT  AQDHS-1):    1058840071F05176101215611021114136003600360036003600340018002000200021001200170 0
     ** ERROR:  START HOUR INCOMPATIBLE WITH TIME CODE
     ** ACTION: CARD NOT PROCESSED.

*** CARD (FORMAT  AQDHS-1):    1058840021F05176703120671071112100500050007000600040002000100050004000300040040
     ** ERROR:  START HOUR INCOMPATIBLE WITH TIME CODE
     ** ACTION: CARD NOT PROCESSED.

*** CARD (FORMAT  AQDHS-1):    1052550004F05176101430611011112200300030002000300030002000200040005000500030005 0
     ** ERROR:  START HOUR INCOMPATIBLE WITH TIME CODE
     ** ACTION: CARD NOT PROCESSED.

*** CARD (FORMAT  AQDHS-1):    1058840021F05176081615611021124121002400250026002600240025002500210022002000220 0
     ** ERROR:  START HOUR INCOMPATIBLE WITH TIME CODE
     ** ACTION: CARD NOT PROCESSED.

*** CARD (FORMAT  AQDHS-1):    1056500003F05176081213611011112200600070006000700070009000900100009000900090000900 90
     ** ERROR:  START HOUR INCOMPATIBLE WITH TIME CODE
     ** ACTION: CARD NOT PROCESSED.
```


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III. UPDATE PROGRAM

A. Identification

ENV019: AQDHS Update Program
System: Enviornmental (ENV)
User Contact: Ben Squires, CALTRANS Transportation Lab (ATSS 8-432-4824)
OCS Contact: Jim Faulkinbury, Office of Computer Systems
Language: PL/1 on IBM 370/168 (ATSS 8-432-4856)

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B. Restrictions and/or Limitations

1. This version of ENV019 is limited to hourly data as input via the Edit Input Program, ENV138.

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C. Program Description

This program is the second of the file management programs for the AQDHS master file. It is the actual update program for the master file taking all of those records not rejected by ENV138 and updating the master file as specified.

Program ENV019 prints out the disposition of all data submitted as input and not previously rejected by the ENV138 edit program.

The output from program ENV019 is the updated SAROAD file as well as a transaction report of all actions taken during the updating of the master file. Data on input cards or tape that did not pass the validation checks in program ENV138 will not appear on the transaction report.

An example of this transaction report can be found in Appendix 2.

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D. Input

The input to ENV019 is the temporary file output by ENV138 and sorted as described in the processing instructions.

This file consists of 81 byte records in the proper format to update the AQDHS master file in program ENV019. The record format is as follows:

Col.	Field	Description
1	Form code	"1"
2	Action code	1,2, or 3 for delete, add, change
3	Agency code	"F"
4-5	Project code	
6-7	State code	"Ø5"
8-11	Area code	
12-14	Site code	
15-19	Parameter code	
20-21	Methods code	
22-23	Units code	
24	Time code	1
25-26	Start hour	"00" or "12"
27-28	Year code	
29-30	Month code	In range of 1-12
31-32	Day code	In range of 1-31
33	Decimal code	0 to 4
34-81	Data	12 four byte fields

DDNAME: CARDIN

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E. Output

The output of program ENV019 consists of the updated AQDHS master file and a printed report of actions taken and error messages.

1. AQDHS Master File Output

This file consists of 68 byte binary records as follows:

Byte Col.	Field	Description
1-2	Area code	
3-4	Site code	
5-8	Parameter code	
9-10	Methods code	
11-12	Year code	
13-14	Month code	In range of 1-12
15-16	Day code	In range of 1-31
17-18	Units code	
19-20	Decimal code	
21-68	24 two byte data fields	

DDNAME: AQDHSI

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2. Print Files

a. The Transaction Report (example in Appendix 2) is a listing of the action taken on those records input into ENV019.

DDNAME: REPORT SYSOUT=A

b. Error messages are contained in a separate listing.

DDNAME: SYSPRINT SYSOUT=A

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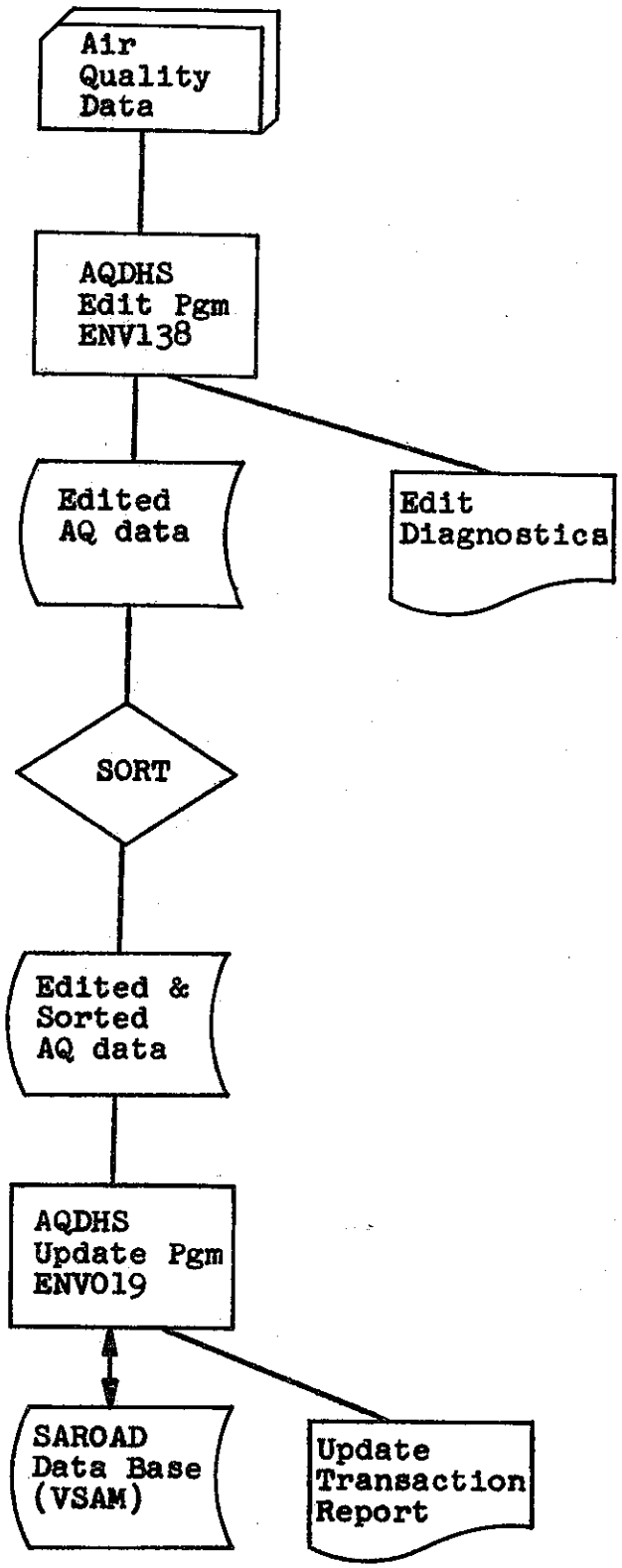
F. Processing Instructions

1. I/O Flow Chart



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2. Required Resources

a. This program requires 192K of memory for execution.

b. The number of lines output is a function of the number of records input. In general, no more than 2 times the number of input records would be required for the line count. The default value for lines should be more than sufficient for execution.

c. CPU time for the program is nominal. 20 update records can be added in .5 CPU seconds.

d. Error Messages.

The following error messages are produced by this program:

ERROR IN TRANSACTION CODE. RECORD NO=____ KEY=_____
RECORD NOT PROCESSED. - Self explanatory.

KEY ALREADY EXISTS IN FILE - REQUEST IGNORED TRANS=_____.
The record to be added is already in the master file.

KEY NOT FOUND - REQUEST IGNORED TRANS=
The record to be deleted or changed is not in the master file.

NO SPACE LEFT TO ADD RECORD - JOB TERMINATED
VSAM data set full and must be reorganized. Contact OCS representative.

KEY PROBLEM FOUND - ONCODE= _____
TRANS=_____
Unresolved problem in PL/1 forward listing to OCS contact.

BAD INPUT RECORD DETECTED - TRANS=_____
A alpha character was found in a numeric field of the input record.

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G. Programmers Narrative

ENVØ19 is written in PL/1 using a keyed VSAM data file. ONCODE, ENDFILE, and ENDPAGE options of PL/1 are utilized. Program operation is as follows:

1. The files are opened.

2. A call to procedure NEXTIN reads the next input transaction record.

3. Depending on the transaction code in the update record, procedures ADD-PROC or UPDT-PROC are called, or the record is deleted from the AQDHS file if it was a delete record.

4. Since two update records are necessary to create one AQDHS master record, if either ADD-PROC or UPDT-PROC are called, the start hour is interrogated to determine if another read is necessary via procedure NEXTIN12.

5. If all data for the day is available the AQDHS record is either added or changed according to the transaction code.

6. Steps 2 thru 5 are continued until the end of file is reached for the update records at which point the control totals are printed, the files closed and the job terminated.

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APPENDIX 2

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Requirements for Data Guidance

Program Number ENV019 Name Update Program AQDHS

Section Name Air Quality

Application System Environmental (ENV)

Date 14 Oct., 1977

Status of this release:

● New ○ Modification

- ● System Flow Chart
- ○ Programming Assignment Sheet
- ● Formats
- ● Description of Data Control Cards
- ● Halts and Messages
- ● Balancing and Controls
- ● Sample JCL
- ○ Hardware/Software Requirements

Location:

DSNAME TM.ENV.LOADLIB

Volume SYS003 Expiration Date

Input Files:

	DDNAME	BLOCK SIZE	DSNAME	ORIGIN*	MAXIMUM FILE SIZE	FILE RETENTION
1.	CARDIN	81/810	Edited & Sorted input from ENV138			
2.	AQDHSI	VSAM	I/O file - direct access			
3.						
4.						
5.						

Output Files:

	DDNAME	BLOCK SIZE	DSNAME	DESTINATION*	MAXIMUM FILE SIZE	FILE RETENTION
1.	REPORT	133/133	Transaction Update Report			
2.	SYSPRINT	133/133	Updat Error Msg Report			
3.	AQDHSI	VSAM	Updated SAROAD Data Base			
4.						
5.						
6.						
7.						
8.						

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Rev. 7/74 Page 1 of 2

*Document, Program, or Department. Specify "plotter" if applicable.

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Requirements for Data Guidance (Program Number ENV019) Date 14 Oct., 1977

Output Distribution Requirements:

- ○ Run on standard 1-part paper (Form No. 13158.16)
- ● Run on Form No. _____, ___-part paper
  As requested

Copies will be distributed to:

Sorts:

Input file CARDIN must be sorted

SORT FIELDS=(3,14,A,24,1,A,27,2,A,25,2,A),FORMAT=CH TR.SORTCARD(ENG138S2)

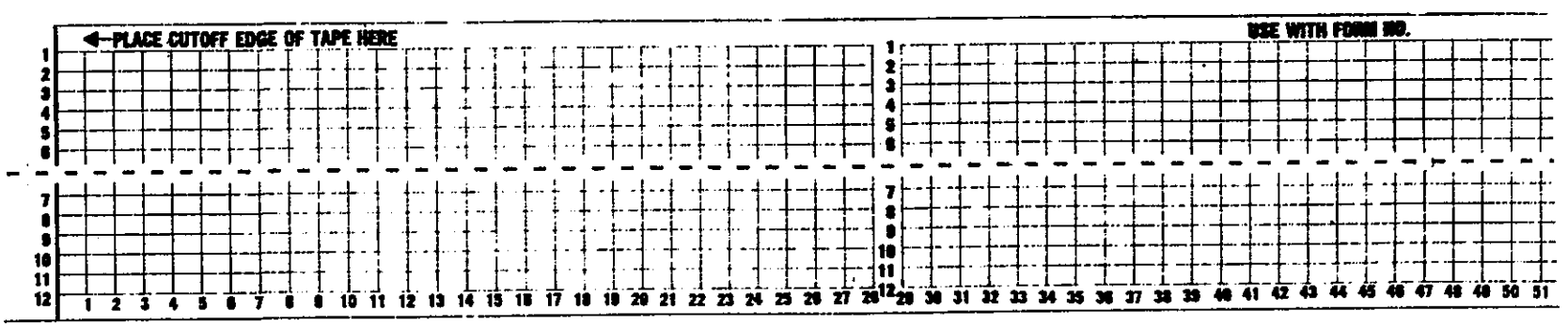
32

Frequency:

- ○ One time only
- ○ Daily
- ○ Semi-weekly
- ○ Weekly
- ○ Semi-monthly
- ○ Monthly
- ○ Quarterly
- ○ Semi-annually
- ○ Annually
- ● On request
- ○ Other _____

Carriage Control Tape:

- ● Standard
- ○ As Shown



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Sample JCL ENV138 & ENV019

```
//T_ENV___ JOB (T_100P,____,_____,____L),name,CLASS=_,REGION=190K
//EDIT    EXEC  PGM=ENV138
//STEPLIB  DD   DSN=TM.ENV.LOADLIB,DISP=SHR
//DDX      DD   *
     Input data cards or card image records
//DD3      DD   UNIT=SYSDA,DISP=(,PASS),SPACE=(CYL,(1,1)),
//              DCB=(RECFM=FB,LRECL=81,BLKSIZE=810)
//DD2      DD   SYSOUT=A
/*
//SORT    EXEC  PGM=IGHRC000,PARM='CORE=038000,MSG=AP',REGION=64K
//SORTLIB  DD   DSN=SYS1.SORTLIB,DISP=SHR
//SYSOUT   DD   SYSOUT=A
//SORTWK01 DD   UNIT=(SORTDA,3),SPACE=(CYL,(2),,CONTIG)
//SORTWK02 DD   UNIT=(SORTDA,3),SPACE=(CYL,(2),,CONTIG)
//SORTWK03 DD   UNIT=(SORTDA,3),SPACE=(CYL,(2),,CONTIG)
//SORTIN   DD   DSN=*.EDIT.DD3,DISP=(OLD,DELETE),
//              DCB=(RECFM=FB,LRECL=81,BLKSIZE=810)
//SYSIN    DD   DSN=TR.SORTCARD(ENG138S2),DISP=SHR
/*
//UPDT    EXEC  PGM=ENV019
//STEPCAT  DD   DSN=TRUCAT01,DISP=SHR
//STEPLIB  DD   DSN=TM.ENV.LOADLIB,DISP=SHR
//         DD   DSN=SYS2.PLILIB,DISP=SHR
//REPORT   DD   SYSOUT=A
//SYSPRINT DD   SYSOUT=A
//AQDHSI   DD   DSN=TRUCAT01.T_.----------------,DISP=SHR,
//              AMP=AMORG,VOL=SER=_____,UNIT=3330-1
//CARDIN   DD   DSN=*.SORT.SORTOUT,DISP=(OLD,DELETE)
/*
```


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FORMAT DESCRIPTION

ENV138 AQDHS Edit Program

PROGRAM ORIGINATING FORMAT (NUMBER, FILE CODE, AND NAME)

DATE	ORIGINATOR	REVIEWER
14 Oct 77	JWF	

FILE NAME Temporary file to ENV019 FORMAT TITLE

Form Code	Action Code	Agency Code	Project Code	State Code	Area Code	Site Code	Parameter Code	Methods Code	Units Code	Time Code	Start Hour	Year	Month	Day	Dec. Code	Hourly Data			
																Hour 0 or 12	Hour 1 or 13	Hour 2 or 14	Hour 3 or 15

Hourly Data								
Hour 4 or 16	Hour 5 or 17	Hour 6 or 18	Hour 7 or 19	Hour 8 or 20	Hour 9 or 21	Hour 10 or 22	Hour 11 or 23	EOR

MODE: BINARY-B

LABELS: STANDARD ☒

RECORD FORMAT: FIXED-F ☒

RECORD LENGTH 81

RECORDS PER BLOCK 10

INPUT ☐ OUTPUT ☒

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FORMAT DESCRIPTION

ENV019 AQDHS Update Program

PROGRAM ORIGINATING FORMAT (NUMBER, FILE CODE, AND NAME)

DATE	ORIGINATOR	REVIEWER
14 Oct	77 JWF	

FILE NAME TRUCATO1.T .---------- FORMAT TITLE SAROAD

Area Code	Site Code	Parameter Code	Methods Code	Year Code	Month Code	Day Code	Units Code	Decimal Code	Hourly Data Fields														
									Hour 0	Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour10	Hour11	Hour12	Hour13	Hour14

Hourly Data Fields									EOR
Hour15	Hour16	Hour17	Hour18	Hour19	Hour20	Hour21	Hour22	Hour23	

MODE: BINARY-(B) PACKED-P

LABELS: STANDARD ■ NON-STANDARD ☐ NO LABELS ☐

RECORD FORMAT: FIXED-F ☐ VARIABLE-V ☐ UNDEFINED-U ☐

RECORD LENGTH 68

RECORDS PER BLOCK VSAM

BLOCK SIZE

INPUT ■ OUTPUT ■

PAGE ___ OF ___

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Sample Transaction Report Listing - ENV019

```
ENV019     AQDHS1 UPDATE PROGRAM     COMPILED  6-15-77 BY J. FAULKINBURY

                    TRANSACTION REPORT          RUN DATE 77/09/27

     72   55   42   55  195  742  901  876  608  551  558  539  546  627  741  709  719  686  601  413  323  278  261 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 09 28       75  00
    140  108   61   54  127  315  360  425  481  491  500  513  499  529  556  557  551  613  575  374  295  308  309 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 09 29       75  00
    162  118   57   40   69  144  172  232  302  357  412  441  511  552  574  481  538  542  506  439  368  309  297 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 09 30       75  00
     62   38   31   51  195  752  903  873  650  522  521  479 9999  535  653  674  681  496  361  277  277  224  172 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 01       75  00
     56   42   37   48  183  757  917  874  607  529  504  463  483  539  649  687  705  548  397  285  278  252  187 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 02       75  00
     60   48   47   49  177  740  933  865  622  502  487  481  480  526  649  696  697  560 9999 9999  288  253  212 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 03       75  00
     68   46   40   53  178  725  916  870  622  515  513  464  493  568  667  703  737  639  502  311  307  261  198 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 04       75  00
     76   51 9999   63  178  723  925  854  609  528  540  522  533  632  739  752  732  692  649  421  319  288  264 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 05       75  00
    128  104   65   58  126  323  367  432  462  512  537  505  493  518  529  539  549  626  613  383  306  289  295 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 06       75  00
    152  109   62   40   65  140  188  225  301  377  439  469  505  516  529  536  576  592  572  464  355  296  233 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76300 11 74 10 07       75  00
     60   37   31   46  186  648  768  772  711  543  499  462  466  523  633  653  686  496  340  248  261  225  166 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 11       12  00
   9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999   46 9999   44   44   45   46   46   49   50   51   53 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 12       12  00
   9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999   47   45   44   44   43   46   46   49   49   52   54 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 13       12  00
     65   65   65   65   53   44   42   42   45   45   45   46   46   45   44   43   43   45   44   46   48   50   51 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 14       12  00
     60   64   65   65   58   52   51   49   48   47   47   47   46   48   46   47   47   46   46   47   48   50   49 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 15       12  00
     56   65   65   65   65   58   55   54   51   49   48   48   48   48   47   46   47   46   46   46   47   50   53 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 16       12  00
     65   65   55   65   51   43   42   40   41   45   45   45   46   46   45   45   44   47   48   51   51   51   55 9999

ADD SUCCESSFUL.     TRANS = 3120 301 76400 11 74 09 17       12  00
```


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ENV019 AQDH81 UPDATE PROGRAM COMPILED 6-15-77 BY J. FAULKINBURY

TRANSACTION REPORT RUN DATE 77/09/26

```
CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 13      75  00
     120   88   60   60  158  640  967  955  859  772  762 9999  765  806  869  825  745  703  567  408  379  373  303 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 14      75  00
     128   94   58   65  154  663  982  912  867  783  782  775  781  856  895  776  717  712  669 9999  425  448  417 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 15      75  00
     236  194  105   72  111  237  371  513  626  620  612  620  677  676  683  652  626  664  608  467  396  389  380 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 16      75  00
     281  203   97   68   62  111  160  236  364  459  471  524  596  630  659  676  693  616  532  494  464  439  325 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 17      75  00
      97   71   52   56  161  650  932  864  855  733  713  727 9999 9999  832  763  715  650  460  374  357  329  257 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 18      75  00
     115   76   53   63  157  651  904  891  885 9999 9999 9999 9999 9999 9999  793  734  701  534  404  370  367  308 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 19      75  00
     117   83   59   59  155  623  948  920  847  775  755  738  782  815  868  785  732  685  581  421  394 9999 9999 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 20      75  00
     125   89   62   59  161  638  943  898  870  782  757  731  773  831  897  819  720  683  573  442  400  411  331 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 21      75  00
     141  105   61   62  166  616  933  898  849  755  763  761  808  812  722  734  735  764  690 9999 9999  400  371 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 22      75  00
     237  175  105   70  100  219  330  510  589  610  615  639  674  659  655  664  720  751  643  479  390  379  388 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 23      75  00
     266  202   98   68   63  109  152  226  327  439  549  610  590  584  635  684  665  623  597  507  439  417  309 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 24      75  00
     121   89   56   63  162  652  960  907  853  772  746  715  756  794  847  801  749  745  524  386  365  367  288 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76300 11 74 06 25      75  00
     115   80   60   65  160  632  941  863  864  788  734  728  754  810  866  815  768  793  587  412  383  391  294 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76400 11 74 06 13      12  00
    9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999   55   52   53   52   57   58   61   63   64   62   65 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76400 11 74 06 13      12  00
      65   65   65   65   65   58   41   43   52   54   54 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76400 11 74 06 14      12  00
      65   65   65   65   65   57   40   33   32   55   55   56   56   53   50   34   48   58   57 9999   59   60   62 9999

CHANGE SUCCESSFUL. TRANS = 4180 201 76400 11 74 06 15      12  00
```

Sample Transaction Report Listing - ENV019

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Sample Error Report Listing - ENV019

```
ENV019     AQDHS1 UPDATE PROGRAM     COMPILED  6-15-77 BY J. FAULKINBURY

                    ERROR MESAGES          RUN DATE 77/09/27

KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176300117510074092309999999999999999999999999999990838071005340520047 2
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176400111210074091100065006500650065005300440042004200450045004600 46
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176400111211274092300046004600440045004400480048004900520052005399 99
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176400111210074092309999999999999999999999999999990040004200440045 0045
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176500117510074091100009000600040020008601420032005700200029002000 28
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176500117510074092309999999999999999999999999999990022006100270019 0024
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176600111210074091100020001000080018000800020001000100010001000100 02
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176600111211274092300001000100020001000200020001000200030004000499 99
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030176600111210074092309999999999999999999999999999990002000200010001 0001
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276300117510074091100089006600430046007903310640061704850454049604 75
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276300117510074092309999999999999999999999999999990639048104340470047 2
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276400111210074091100065006500650065006500610057005600580058005800 58
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276400111211274092300059005900500040004900580058006200620063006496 99
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276400111210074092309999999999999999999999999999990058005900590059 0059
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276500117510074091100014001100080006001800920049004800300020001700 26
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276500117510074092309999999999999999999999999999990036001700270024001 8
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276600111210074091100031002200260022002300030002000200020002000200 02
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276600111211274092300002000100070008000300020002000300020004000599 99
KEY ALREADY EXISTS IN FILE - REQUEST IGNORED
        TRANS = 12F0505312030276600111210074092309999999999999999999999999999990002000200020002 0002
```

ANALYSIS PROGRAM

A. Identification

>2: AQDHS Analysis Program
=m: Environmental (ENV)
- Contact: Ben Squires, CALTRANS Transportation Lab (ATSS 8-432-4824)
Contact: Jim Faulkinbury, Office of Computer Systems
guage: PL/1 on IBM 370/168 (ATSS 8-432-4856)

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B. Restrictions and/or Limitations

(None noted at this time.)

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C. Program Description

The Data Analysis Program performs simple statistical analysis for air quality and meteorological data stored on the master file. The analysis program computes the maximum and minimum values, arithmetic mean, standard deviation, geometric standard deviation, geometric mean, and the 10, 30, 50, 70, 90, 95, 99 and 99.9 percentile occurrences.

The program is run separately, independent of file maintenance or creation.

For every analysis, the user submits full specification codes for area, site, parameter, method and units. In addition, two sets of dates (year, month, day) must be furnished, "from" and "to", in order to indicate the inclusive starting and ending dates of the period of analysis. The user may specify the pollutant minimum detectable value and decimal point indicator for that value used in the substitution of zero data values. If these two fields are left blank, a value of 10^{-DP} (where DP is the pollutant reporting decimal point) will be substituted for any zero value encountered.

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D. Input

The input to ENV022 consists of the AQDHS master file and the control cards specifying the analysis to be performed.

1. AQDHS Master File Input

This file consists of 68 byte binary records as follows:

Col.	Field	Description
1-2	Area code	
3-4	Site code	
5-8	Parameter code	
9-10	Methods code	
11-12	Year code	
13-14	Month code	In range of 1-12
15-16	Day code	In range of 1-31
17-18	Units code	
19-20	Decimal code	
21-68	24 two byte data fields	

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2. Control Card Input

The input format of the Control Card(s) is shown below.

Card Column	Description
1-4	Area code
5-7	Site code
8-12	Parameter code
13-14	Methods code
15-16	Units code
17-18	Year code (From)
19-20	Month code (From)
21-22	Day code (From)
23-24	Year code (To)
25-26	Month code (To)
27-28	Day code (To)
29-32	Minimum detectable value
33-34	Minimum detectable decimal point
35-72	Additional area information, at user's discretion. Content of this field is simply listed on output (city name, street name, site description, etc.).

DDNAME: CARDIN

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E. Output

The output for ENV022 consists of the statistical analysis print file. A sample printout is shown in Appendix 3.

A separate output page is printed for every control card submitted if it differs from the other control cards with respect to site code and one or more of the other codes. Control cards that differ only with respect to site code will be listed on the same output page.

```
DDNAMES:  REPORT    SYSOUT=A
          SYSPRINT  SYSOUT=A
```


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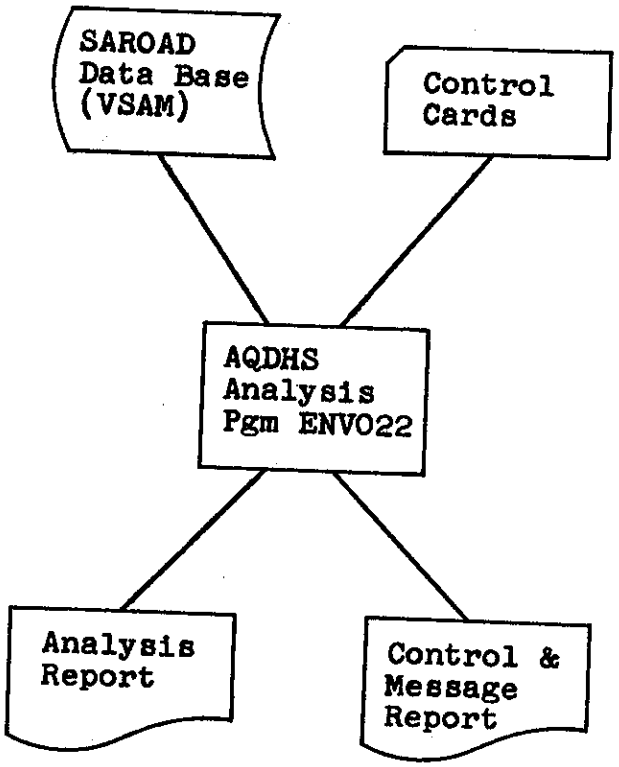
F. Processing Instructions

1. I/O Flow Chart



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2. Required Resources

a. This program requires 192K of memory for execution.

b. The number of lines output is a function of the number of control cards input. In general, no more than 20 lines per analysis should be required for the line count. The default value for lines should be more than sufficient for execution.

c. CPU time for this program is nominal. Two analysis requests can be performed in less than 1 CPU second.

d. Error Messages

The following error message is produced by this program:

END OF TAPE ENCOUNTERED, RECORD NOT FOUND.
No match was found for the requested analysis.

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G. Programmers Narrative

ENVØ22 is written in PL/1 and uses the ONCODE, ENDFILE and ENDPAGE option of the language. Functions SQRT, EXP, LOG, and MOD are also used. Program operation is as follows:

1. Following initialization, a control card is read to setup the analysis specifications (area, site, parameter, inclusive dates) to be run.

2. A start key is formed for the first read of the keyed VSAM AQDHS file.

3. If the key is valid, the data are stored. The new min. and max. values are updated and information for means and standard deviations as well as occurrences of the data values are taken.

4. The next sequential record is read, and if it falls within the range specified for analysis, step 3 is repeated. This continues until all required AQDHS records have been read.

5. Once all data have been read, the means and standard deviations are calculated. The value of data for which occurrences of 10, 30, 50, 70, 90, 95, 99 and 99.9 percentiles have been found are printed with the statistical means and standard deviations for the study.

6. The program returns to step 1 to read another analysis card and the process repeats until all analysis cards have been read at which point the program terminates.

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APPENDIX 3

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Requirements for Data Guidance

Program Number ENV022 Name Statistical Analysis Pgm AQDHS

Section Name Air Quality

Application System Environmental(ENV)

Date 14 Oct., 1977

Status of this release:

- ● New
- ○ Modification

- ● System Flow Chart
- ○ Programming Assignment Sheet
- ● Formats
- ● Description of Data Control Cards
- ● Halts and Messages
- ○ Balancing and Controls
- ● Sample JCL
- ○ Hardware/Software Requirements

Location:

DSNAME TM.ENV.LOADLIB

Volume SYS003 Expiration Date

Input Files:

	DDNAME	BLOCK SIZE	DSNAME	ORIGIN*	MAXIMUM FILE SIZE	FILE RETENTION
1.	AQDHSIN	VSAM	SAROAD Data Base			
2.	CARDIN	80/80	Control Card Input			
3.						
4.						
5.						

Output Files:

	DDNAME	BLOCK SIZE	DSNAME	DESTINATION*	MAXIMUM FILE SIZE	FILE RETENTION
1.	REPORT	133/133	Analysis Report			
2.	SYSPRINT	133/133	Control & Message Report			
3.						
4.						
5.						
6.						
7.						
8.						

*Document, Program, or Department. Specify "plotter" if applicable.

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Requirements for Data Guidance (Program Number ENV022) Date 14 Oct., 1977

Output Distribution Requirements:

- ○ Run on standard 1-part paper (Form No. 13158.16)
- ● Run on Form No. _____, ___-part paper

As requested

Copies will be distributed to:

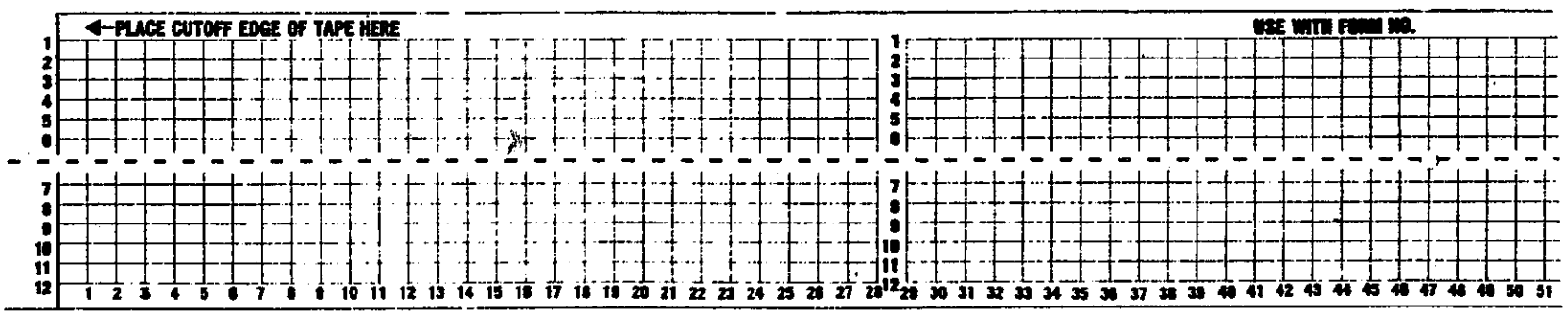
Sorts:

Frequency:

- ○ One time only
- ○ Daily
- ○ Semi-weekly
- ○ Weekly
- ○ Semi-monthly
- ○ Monthly
- ○ Quarterly
- ○ Semi-annually
- ○ Annually
- ● On request
- ○ Other _____

Carriage Control Tape:

- ● Standard
- ○ As Shown



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Sample JCL ENV022

```
//T_ENV___ JOB (T_100P,____,_____,____L),name,CLASS=_,REGION=190K
//STEP1  EXEC  PGM=ENV022
//STEPCAT  DD  DSN=TRUCATO1,DISP=SHR
//STEPLIB  DD  DSN=TM.ENV.LOADLIB,DISP=SHR
//         DD  DSN=SYS2.PLILIB,DISP=SHR
//CARDIN   DD  *
     Control Card Input
//AQDHSIN  DD  DSN=TRUCATO1.T_.--------------------,DISP=SHR,
//              AMP=AMORG,VOL=SER=_____,UNIT=3330-1
//REPORT   DD  SYSOUT=A
//SYSPRINT DD  SYSOUT=A
/*
```


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FORMAT DESCRIPTION

ENV019 AQDHS Update Program

PROGRAM ORIGINATING FORMAT (NUMBER, FILE CODE, AND NAME)

DATE	ORIGINATOR	REVIEWER
14 Oct 77	JWF	

FILE NAME TRUCAT01.T FORMAT TITLE SAROAD

Positions	Field
1–2	Area Code
3–4	Site Code
5–8	Parameter Code
9–10	Methods Code
11–12	Year Code
13–14	Month Code
15–16	Day Code
17–18	Units Code
19–20	Decimal Code
21–70	Hourly Data Fields: Hour 0, Hour 1, Hour 2, Hour 3, Hour 4, Hour 5, Hour 6, Hour 7, Hour 8, Hour 9, Hour10, Hour11, Hour12, Hour13, Hour14, Hour15, Hour16, Hour17, Hour18, Hour19, Hour20, Hour21, Hour22, Hour23
71	EOR

MODE: BINARY-(B) PACKED-P

LABEL: STANDARD NON-STANDARD

RECORD FORMAT: FIXED-F VARIABLE-V

RECORD LENGTH 68

RECORDS PER BLOCK VSAM

BLOCK SIZE

INPUT OUTPUT

PAGE ___ OF ___

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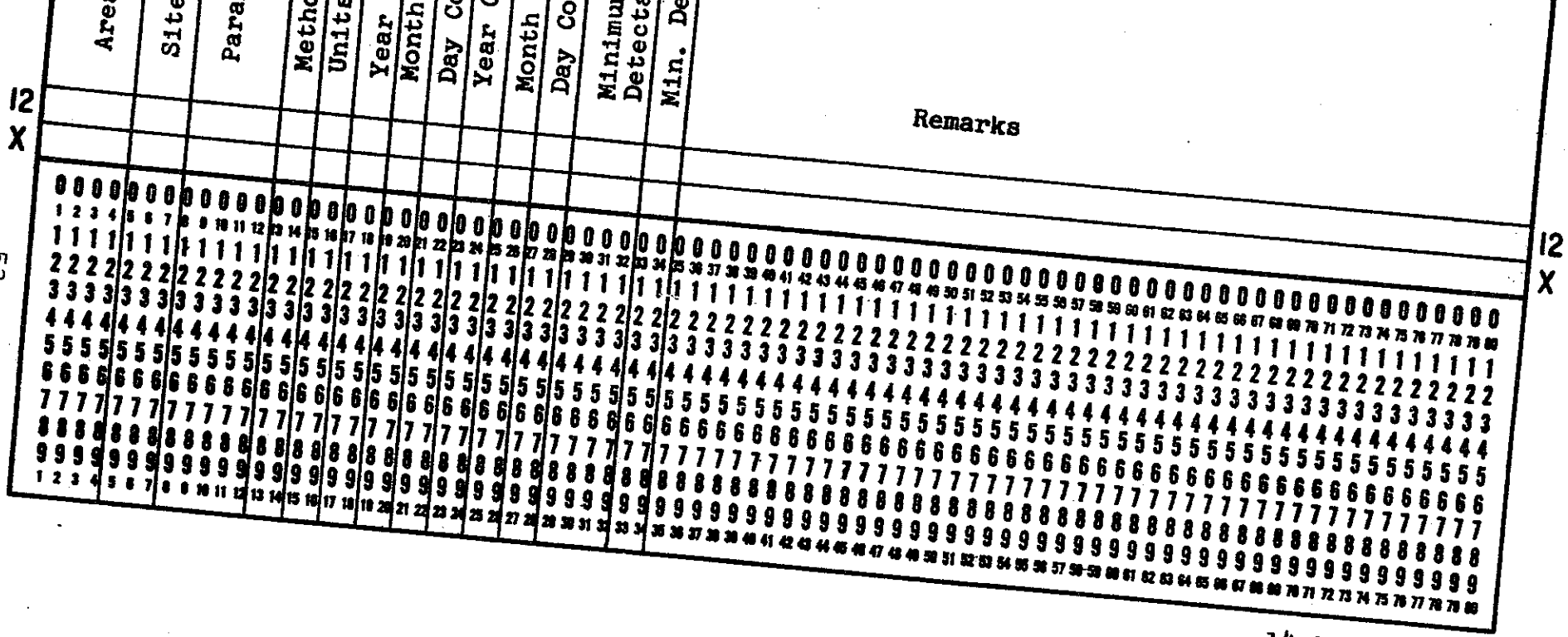
CONTROL CARD ENV022

RIGHT
LEFT

Area Code	Site Code	Parameter Code	Methods Code	Units Code	Year Code (from)	Month Code (from)	Day Code (from)	Year Code (to)	Month Code (to)	Day Code (to)	Minimum Detectable Value	Min. Detect. D.P.	Remarks

12 X



12 X

14 Oct., 1977
JWF

DAS-CS 90-059

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ENV022 AQDHS ANALYSIS PROGRAM COMPILED 9-20-77 BY J. FAULKINBURY

STATISTICAL ANALYSIS

RUN DATE: 77/09/20

AGENCY:STATE AGENCY PROJECT:05 STATE-AREA:05-4180 PERIOD 74/04/11 TO 74/06/10

STATE:CALIFORNIA POLLUTANT:CARBON MONOXIDE METHOD:NONDISPERSIVE INFARED

LOCATION: SITE 1 SAMPLING INTERVAL:1 HOUR UNITS:PARTS PER MILLION

SITE NUM	NUM OBS	MIN OBS	PERCENTILES 10	30	50	70	90	95	99	99.9	MAX OBS	ARITH MEAN	STD DEV	GEOM MEAN	GEOM STD
101	521	1.46	10.07	12.00	13.49	15.39	18.49	20.16	22.26	27.27	27.27	13.84	3.62	13.24	1.40
103	521	1.54	11.32	13.06	14.63	16.31	20.03	22.51	25.53	32.63	32.63	15.08	3.91	14.45	1.39

END OF ENV022

Sample Analysis Report - ENV022

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Sample Control & Message Report

RUN DATE: 77/09/20

ENV022 AQDHS ANALYSIS PROGRAM COMPILED 9-20-77 BY J. FAULKINBURY

CONTROL CARDS & MESSAGES

```
4180101421011107740411740610000102     SITE 1                          035900
  4180101421011174 611     END OF KEY ENCOUNTERED
4180103421011107740411740610000102     SITE 1                          036000
  4180103421011174 611     END OF KEY ENCOUNTERED
```


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V. MONTHLY SUMMARY REPORT PROGRAM

A. Identification

ENV021: AQDHS Monthly Data Report Program
System: Envrionmental (ENV)
User Contact: Ben Squires, CALTRANS Transportation Lab (ATSS 8-432-4824)
OCS Contact: Jim Faulkinbury, Office of Computer Systems
Language: COBOL on IBM 370/168 (ATSS 8-432-4856)

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B. Restrictions and/or Limitations

1. Because of the input restrictions of ENV019, only hourly data are available on the AQDHS master file.

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C. Program Description

Program ENV021 produces fixed-format listings of the 1-hour data stored on the master file. The type and volume of listings generated by the program are governed by control cards submitted by the user. A control card can produce a single page of output or many pages. A page of 1-hour data contains data for a full month.

In addition to the raw data, maximum and mean values are listed in the output.

The complete codes for area, site, parameter, method, year, and month constitute a control group.

The following special coding situations may be used:

(1) If 99 is punched in the control card for month code, all 12 months of data for that control group will be output.

(2) If 99 is punched in the control card for both year and month code, all 12 months of data for all years of the control group will be output.

(3) If all 9's are punched in the control card for parameter, method, year, and month codes, 12 months of data for all years, and all parameters and methods for that control group will be output.

(4) If all 9's are punched in the control card for site, parameter, method, year, and month codes, 12 months of data for all years, all parameters and methods, and all sites for that control group will be output.

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D. Input

The input to ENV021 consists of the AQDHS master file and the control cards specifying the report to be generated.

1. AQDHS Master File Input

This file consists of 68 byte binary records as follows:

Col.	Field	Description
1-2	Area code	
3-4	Site code	
5-8	Parameter code	
9-10	Methods code	
11-12	Year code	
13-14	Month code	In range of 1-12
15-16	Day code	In range of 1-31
17-18	Units code	
19-20	Decimal code	
21-68	24 two byte data fields	

DDNAME: INPFIL

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2. Control Card Input

The input format for the control cards is shown below. No order is required.

Card Column	Description
1-4	Area code
5-7	Site code
8-12	Parameter code
13-14	Method code
15-16	Year code
17-18	Month code
19-34	City name as it should appear on printout.

DDNAME: HDRFIL

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E. Output

The output for program ENV021 consists of the monthly summary reports specified by the control cards. A sample output is contained in Appendix 4.

DDNAME: PRTFIL SYSOUT=A

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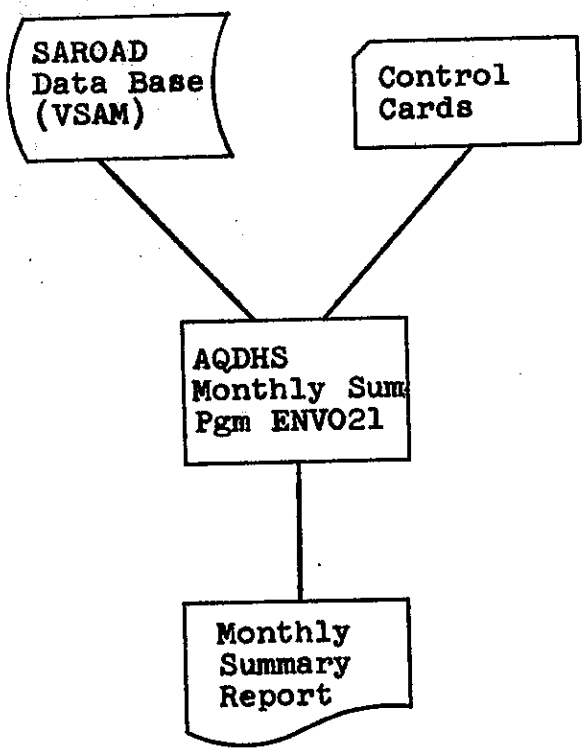
F. Processing Instructions

1. I/O Flow Chart



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2. Required Resources

a. This program requires 76K of memory for execution.

b. The number of lines output is dependent upon the number of monthly summaries requested. Each summary takes about 60 lines.

c. CPU time for this job is nominal, 20 monthly summaries can be generated in less than 1 CPU second.

d. Error Messages

The following error messages are produced by this program:

ERROR MESSAGE	Error.
NO MATCH CC1	A record could not be found in the master file to match the area code on the control card.
CC3 FLAG	A record could not be found on the master file to match the site code on the control card before next area was found.
CC5 FLAG	A record could not be found on the master file to match the pollutant code on the control card before the next area or site was found.
CC7 FLAG	A record could not be found on the master file to match the year code on the control card before next area, site, or pollutants codes were found.
CC9 FLAG	A record could not be found on the master file to match the month code on the control card before next area, site, pollutants, or year codes were found.

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ERROR MESSAGE	Error.
PROG1 FLAG-MO	Month code not found in program table.
PROG1 FLAG-POL	Pollutant code not found in program table.
PROG1 FLAG-UNITS	Unit code not found in program table.
CC2 FLAG	The end of file was reached on the master file before the desired site code was found.
CC4 FLAG	The end of file was reached on the master file before the desired pollutant code was found.
CC6 FLAG	The end of the file was reached on the master file before the desired year was found.
CC8 FLAG	The end of the file was reached on the master file before the desired month was found.

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APPENDIX 4

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Requirements for Data Guidance

Program Number ENV021 Name Monthly Summary Program AQDHS

Section Name Air Quality

Application System Environmental(ENV)

Date 14 Oct., 1977

Status of this release:

● New ○ Modification

- ● System Flow Chart
- ○ Programming Assignment Sheet
- ● Formats
- ● Description of Data Control Cards
- ● Halts and Messages
- ○ Balancing and Controls
- ● Sample JCL
- ○ Hardware/Software Requirements

Location:

DSNAME TM.ENV.LOADLIB

Volume SYS003 Expiration Date

Input Files:

	DDNAME	BLOCK SIZE	DSNAME	ORIGIN*	MAXIMUM FILE SIZE	FILE RETENTION
1.	HDRFIL	80/80	Control Card Input			
2.	INPFIL	VSAM	SAROAD Data Base			
3.						
4.						
5.						

Output Files:

	DDNAME	BLOCK SIZE	DSNAME	DESTINATION*	MAXIMUM FILE SIZE	FILE RETENTION
1.	PRTFIL	133/133	Monthly Summary Report			
2.						
3.						
4.						
5.						
6.						
7.						
8.						

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*Document, Program, or Department. Specify "plotter" if applicable.

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Requirements for Data Guidance (Program Number ENV021) Date 14 Oct., 1977

Output Distribution Requirements:

- ○ Run on standard 1-part paper (Form No. 13158.16)
- ● Run on Form No. _____, ___-part paper
  As requested

Copies will be distributed to:

Sorts:

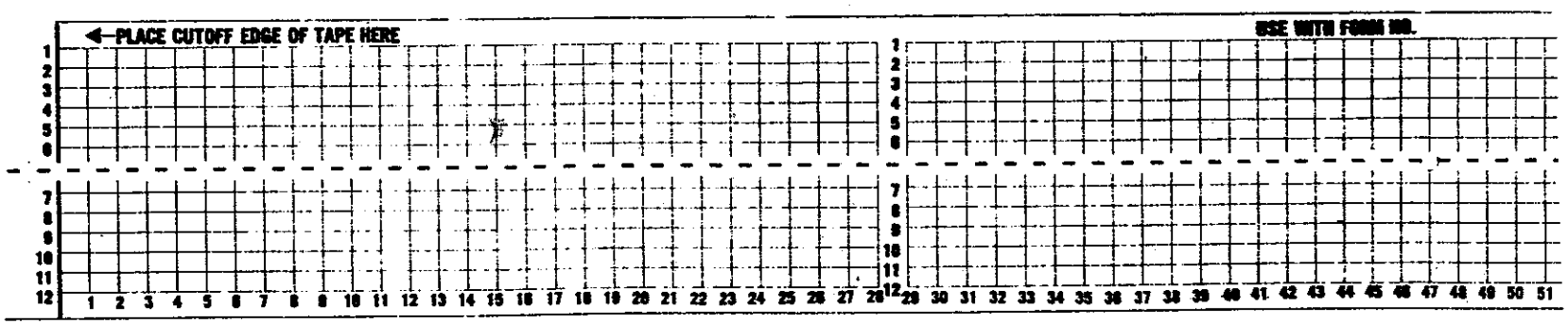
67

Frequency:

- ○ One time only
- ○ Daily
- ○ Semi-weekly
- ○ Weekly
- ○ Semi-monthly
- ○ Monthly
- ○ Quarterly
- ○ Semi-annually
- ○ Annually
- ● On request
- ○ Other _____

Carriage Control Tape:

- ● Standard
- ○ As Shown



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10/10/67 Page 2 of 2

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Sample JCL ENV021

```
//T_ENV___ JOB (T_100P,____,_____,____L),name,CLASS=_,REGION=100K
//STEP1  EXEC  PGM=ENV021
//STEPCAT  DD  DSN=TRUCAT01,DISP=SHR
//STEPLIB  DD  DSN=TM.ENV.LOADLIB,DISP=SHR
//         DD  DSN=TR.DOTLIB,DISP=SHR
//INPFIL   DD  DSN=TRUCAT01.T_.--------------------,DISP=SHR,
//              AMP=AMORG,VOL=SER=_____,UNIT=3330-1
//PRTFIL   DD  SYSOUT=A
//HDRFIL   DD  *
     Control Card Input
/*
```


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FORMAT DESCRIPTION

DATE	ORIGINATOR	REVIEWER
14 Oct	77 JWF	

ENV019 AQDHS Update Program

PROGRAM ORIGINATING FORMAT (NUMBER, FILE CODE, AND NAME)

FILE NAME TRUCATO1.T FORMAT TITLE SAROAD

Area Code	Site Code	Parameter Code	Methods Code	Year Code	Month Code	Day Code	Units Code	Decimal Code	Hourly Data Fields													
									Hour 0	Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour10	Hour11	Hour12	Hour13	Hour14

Hourly Data Fields									EOR
Hour15	Hour16	Hour17	Hour18	Hour19	Hour20	Hour21	Hour22	Hour23	

MODE: BINARY (B) PACKED-P

LABELS: STANDARD ☒ NON-STANDARD ☐ NO LABELS ☐

RECORD FORMAT: FIXED-F ☐ VARIABLE-V ☐ UNDEFINED-U ☐

RECORD LENGTH 68
RECORDS PER BLOCK VSAM
BLOCK SIZE

INPUT ☒ OUTPUT ☒

PAGE ___ OF ___

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RIGHT
LEFT

CONTROL CARD - ENV021

Area Code	Site Code	Parameter Code	Method Code	Year Code	Month Code	City Name	Blank
12							12
X							X
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9
1 2 3 4	5 6 7	8 9 10 11 12	13 14	15 16	17 18	19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34	35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

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Sample Monthly Summary Report - ENV021

AIR QUALITY DATA REPORT

****

025900

CARD IMAGE OF INPUT 418020175400117407SITE 2

AGENCY: STATE AGENCY

STATE: CALIFORNIA

CITY: SITE 2

SITE: 201

YEAR: 1974

MONTH: JULY

POLLUTANT: HORZ WIND ANGLE

UNITS: DEGREES

DATA FORMAT: X.XXX

HOUR

DA	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	N	MEAN
01						3.	523	3.744	3.652	3.482	3.375	4.107	5.598	8.044	8.754	7.144	7.789	4.936	4.682						144	4.291
02																									0	
03						3.	713	4.079	3.971	4.170	4.911	4.893	4.904	4.964	4.935	4.992	4.891	5.041	4.995	4.896					144	4.668
04																									0	
05																									0	
06																									0	
07																									0	
08						2.	739	2.521	2.754	2.772	3.155	4.102	4.787	5.051	4.885	4.708	4.867	4.861	4.919	4.936					144	4.076
09						4.	207	3.831	3.435	3.450	3.937	4.923	4.623	4.902	4.856	4.933	4.936	5.023	5.031	4.945					144	4.512
10						3.	314	3.409	3.555	3.664	3.931	4.770	4.528	4.879	4.855	4.873	4.929	4.917	4.850	4.808					144	4.377
11							.995	.556	2.903	3.316	4.169	4.872	5.048	4.939	4.848	4.857	4.892	4.867	4.852	5.000					144	4.008
12						6.	239	5.815	3.767	3.188	4.554	4.831	4.896	4.856	5.002	4.986	5.001	4.887	4.907	4.817					144	4.839
13																									0	
14																									0	
15						3.	273	3.219	3.019	3.412															43	3.231
16																									0	
17						1.	233	3.545	3.919	4.305	3.914	4.865	5.072	4.970	5.135	5.000	5.024	4.953	4.938	4.755					144	4.402
18						5.	679	4.218	4.722	4.911			5.	197	5.105	5.041	4.899	4.781	4.883	4.003	4.951				124	4.816
19																									0	
20																									0	
21																									0	
22																									0	
23																									0	
24																									0	
25																									0	
26																									0	
27																									0	
28																									0	
29																									0	
30																									0	
31																									0	
N						10	10	10	10	8	8	9	9	9	9	9	9	9	9						128	
MN						3.	492	3.494	3.570	3.667	3.993	4.670	4.866	4.941	4.937	4.885	4.901	4.930	4.842	4.766					1284	4.399
MX						6.	239	5.815	4.722	4.911	4.911	4.923	5.197	5.105	5.135	5.000	5.024	5.041	5.031	5.000					1286	4.239

VI. DATA REPORT PROGRAM

A. Identification

ENVØ17: AQDHS Data Report Program
System: Environmental (ENV)
User Contact: Paul Benson, CALTRANS Transportation Lab (ATSS 8-432-4764)
OCS Contact: Jim Faulkinbury, Office of Computer Systems
Language PL/1 on IBM 370/168 (ATSS 8-432-4856)

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B. Restrictions and/or Limitations

1. A maximum of 50 Input Variable Cards may be used.
2. A maximum of 16 Output Variable Cards may be used.
3. A maximum of 999 Date Cards may be used.
4. A maximum of 99 Transgeneration Cards may be used.
5. A maximum of 30 Limit Cards may be used.

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C. Program Description

The Data Report Program will selectively print out data for up to 16 requested file variables (parameter/method codes). These variables can be either input variables or transgenerated variables produced by the program from the input variables. Each line of printout represents one hour of data for all of the requested output variables.

Through the use of Date Cards, specific hours can be selected. A scan option which can select all hours, days or months or any combination thereof, is also available by use of Date Cards. See paragraph D.1.e.

The output format is specified by a Format Card which positions the decimal point for each field in the print line

Twenty eight transgeneration equations are provided by which data can be manipulated into new variables. See paragraph D.1.f.

Limits cards are provided to permit the user to selectively retain and print only those hours which meet specified criteria. Each Limits Card has 3 range fields. If the variable specified by the Limit card falls within any one of these ranges, the data is retained for print, otherwise the line is surpressed. Likewise multiple Limits Cards can be used to select on ranges of up to 30 variables.

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D. Input

The input to ENVØ17 consists of the AQDHS master file stored on a VSAM data base and the control cards specifying the report to be generated.

1. AQDHS Master File Input

This file consists of 68 byte binary records as follows:

Col.	Field	Description
1-2	Area code	
3-4	Site code	
5-8	Parameter code	
9-10	Methods code	
11-12	Year code	
13-14	Month code	In range of 1 to 12
15-16	Day code	In range of 1 to 31
17-18	Units code	
19-20	Decimal code	
21-68	24 two byte data fields	

DDNAME: AQDHSIN

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2. Control Cards

Seven types of control cards are used by this program. All integer values should be right justified within their designated fields.

DDNAME: CARDIN

a. Identification Card (Required as 1st Control Card)

Cols.	Field
1-6	Identification "ENVØ17"
7-31	Site description alphanumeric info
32-35	Area code
36-38	Site code
39-80	Remarks

b. Format Card (Required as 2nd Control Card)

Cols.	Field
1-6	Identification "FORMAT"
7-8	Field description for 1st print field
9-10	" " " 2nd " "
37-38	" " " 16th " "

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The print field descriptions contain two characters as follows:

The 1st character describes the total field length. This should be either a 6 or a blank.

The 2nd character describes the position of the decimal point in the print field. The range is Ø to 4 for formats XXXX. to .XXXX. If the 1st character is blank, the second character should also be blank. This combination ignores the print field. (Note: blanks should not be used between valid format descriptions. They should only be used at the end of the format card to blank out for less than 16 output variables.) As an example, to print a data field in two decimal places (XX.XX), the format would be '62'.

c. Input Variable Card

Cols.	Field
1-6	Identification "INVAR "
7-8	Input variable number
9-13	Parameter code
14-15	Methods code
16-18	Site code

The input variable number is the array location where data for the specified parameter will be stored. Any value from 1 to 99 may be assigned as an input variable number. Reference to an input variable by subsequent control cards will be made by using this number.

d. Output Variable Card

Cols.	Field
1-6	Identification "OUTVAR"
7-8	Output variable number
9-15	1st line of title description
16-22	2nd line of title description

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The output variable number is the array location from which data will be extracted. The print field for the data is dependent upon the relative position of the output variable card to the other Output Variable Cards in the input deck, i.e., the 1st Output Variable Card request read by the card reader will appear in the 1st (leftmost) position of the output listing. The print field format for the output variables has already been defined by the Format Card.

e. Date Card

Cols.	Field	
1-6	Identification	"DATE "
7-8	Year	
9-10	Month	
11-12	Day	
13-14	Hour	

Each Date Card will produce a line of print for the specified year, month, day, hour combination provided. In addition, certain all inclusive options are available. If "99" is put in the hour field, 24 hours will be printed if data exist for all of them (if there is not data for an hour, the print line will be suppressed for that hour). If "99" is specified in the day field, all 31 days for the month will be listed. If "99" is contained in the month field, all 12 months will be listed. If "99" is contained in the month field, all 12 months will be listed. Any combination of month, day, hour selections can be used. There must be a Date Card for each year scanned. When the user knows that data are available for only several months of the year, the program will run more efficiently if Date Cards are used for each pertinent month rather than a year.

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f. Transgeneration Card

Cols.	Field
1-6	Identification "TRANGN"
7-8	Transgeneration code
9-10	New variable number X_k
11-12	Variable number X_i
13-18	Variable number X_j or constant C

The variable positions X_i, X_j and X_k correspond to the array locations used by input and output variable cards. Variable numbers not specified by either card type may also be used as interim storage locations for further calculation. Interim values for a series of transgenerations may be stored under the same variable number if desired, i.e., X_k may equal X_i or X_j, for a given transgeneration. This should only be done for interim calculations since previous values stored at X_i or X_j will be replaced by the transgenerated value. As with input and output variable numbers, transgenerated variable numbers must lie within the range 1 to 99 inclusive. The possible transgenerations available to the program are:

Code	Transgeneration	Restrictions
1	$\sqrt{X_i} \rightarrow X_k$	$X_i \geq \emptyset$
2	$\sqrt{X_i} + \sqrt{X_i+1} \rightarrow X_k$	$X_i \geq \emptyset$
3	$\log_{10} X_i \rightarrow X_k$	$X_i > \emptyset$
4	$e^{X_i} \rightarrow X_k$	
5	$1/X_i \rightarrow X_k$	$X_i \neq \emptyset$
6	$X_i + C \rightarrow X_k$	
7	$X_i C \rightarrow X_k$	
8	$X_i^{C} \rightarrow X_k$	$X_i \geq \emptyset$

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Code	Transgeneration	Restrictions
9	$X_i + X_j \rightarrow X_k$	
10	$X_i - X_j \rightarrow X_k$	
11	$X_i X_j \rightarrow X_k$	
12	$X_i / X_j \rightarrow X_k$	$X_j \neq \emptyset$
13	if $X_i \geq C$, $1 \rightarrow X_k$ otherwise $\emptyset \rightarrow X_k$	
14	if $X_i \geq X_j$, $1 \rightarrow X_k$ otherwise $\emptyset \rightarrow X_k$	
15	$\log_e X_i \rightarrow X_k$	$X_i > \emptyset$
16	Sin $X_i \rightarrow X_k$	
17	Cos $X_i \rightarrow X_k$	
18	arctan $X_i \rightarrow X_k$	
19	$X_i^{X_j} \rightarrow X_k$	
20	$C^{X_i} \rightarrow X_k$	
21	if $X_i \geq C$, $C \rightarrow X_k$ otherwise $X_i \rightarrow X_k$	
22	if $X_i \geq X_j$ $X_j \rightarrow X_k$ otherwise $X_i \rightarrow X_k$	
23	arcsin $X_i \rightarrow X_k$	$\lvert X_i \rvert \geq 1$
24	arccos $X_i \rightarrow X_k$	$\lvert X_i \rvert \geq 1$
25	$\lvert X_i \rvert \rightarrow X_k$	
26	degrees $X_i \rightarrow$ radians X_k	
27	radians $X_i \rightarrow$ degrees X_k	
28	if $X_i = 0$, $C \rightarrow X_k$ otherwise $X_i \rightarrow X_k$	

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g. Limit Card

Cols.	Field
1-6	Identification "LIMIT "
7-8	Variable number
9-18	Range 1 lower limit
19-28	Range 1 upper limit
29-38	Range 2 lower limit
39-48	Range 2 upper limit
49-58	Range 3 lower limit
59-68	Range 3 upper limit

The variable number corresponds to any array location used by the Input Variable, Output Variable or Transgeneration Cards. The value of data found for that variable must fall within any one of the three ranges or the data line for the respective hour will not be printed for <u>any</u> variables specified by the Output Variable Cards. If more than one Limit Card is used, data must pass the conditions specified by all cards in order for the print line to be printed. A special option is permitted by placing "99" in the variable number field. This option allows the three ranges on the Limit Card to represent hour ranges rather than data ranges. Thus the Limit Card may be used to retrieve specified data for up to three hourly ranges for the days specified by the Date Cards. It is anticipated that this option would be used when the hourly selection option is in effect via the Date Cards. This, however, is not required.

For program efficiency, the Limit Cards should be ordered such that limit specifications least likely to be met appear first in the input deck. Specified limit ranges are inclusive and blank fields will be interpreted as zeroes.

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E. Output

The output of program ENVØ17 consists of print listings. The 1st printout provides a list of control cards and any error messages which may have been encountered. The 2nd printout is the specified data report. Examples of both are contained in Appendix 5.

```
DDNAMES:  REPORT    SYSOUT=A
          SYSPRINT  SYSOUT=A
```


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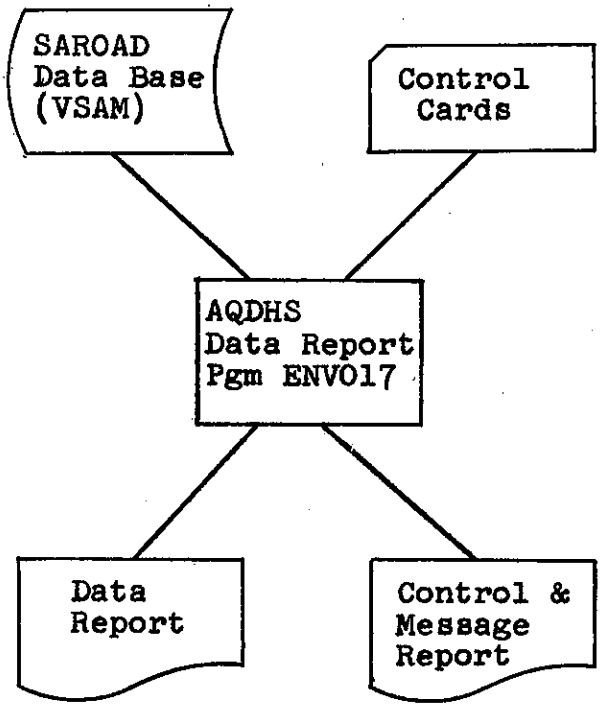
F. Processing Instruction

1. I/O Flow Chart



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2. Required Resources

a. This program requires 190K of memory for execution.

b. The number of lines output is dependent upon the number of Date Card requests. Each hour requested generates 1 line of printout. Page headings require 10 lines.

c. CPU time is nominal. Test runs with 5 input variables, 9 output variables, using hour and day scan options for 1 month of data, and using 4 transgenerations, took less than 2 CPU seconds.

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d. Error Messages

The following error messages are produced by this program:

KEY NOT FOUND - REQUEST IGNORED KEY = _____

The specified area, site, parameter, data combination could not be found. If scan options are used in the Date Cards, this message is only produced if the area, site and parameter combination cannot be found.

KEY PROBLEM FOUND - ONCODE = _____ KEY = _____

This message is produced if some key problem exists in the VSAM file. The OCS contact should be notified for problem resolution.

BAD INPUT CARD DETECTED - CARD:_____

An alpha character was found in control card where a numeric character should have been.

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G. Programmers Narrative

ENVØ17 is written in PL/1 using ON ENDFILE, ONCODE and ON ENDPAGE options of the language. Functions ABS, ACOS, ASIN, ATAN, COS, EXP, LOG, LOG1Ø, SIN, and SQRT are used by the transgeneration options. The program has a main section and two called procedures, TRANSGEN-PROCESS and LIMIT-PROCESS. Program operation is as follows:

1. The 1st control card is read and a check is made to insure that it is the Identification Card. Data are stored for further use.

2. The 2nd control card is read and a check is made to insure that it is the Format Card. Data are stored for futher use.

3. The remaining control cards are read and a determination of card type is made. The cards are reread as the appropriate types and data are stored.

4. Once all of the control cards have been read, the number of each type is checked against the program limits.

5. The main process for accumulating data is started. To the area and site code information obtained from the Ident-Card, a nested loop for year, month and day is set up. Within this loop is another loop for parameters. All data for the specified day (all parameters) is read into an array.

6. A loop for hours is now set up. For each hour of data stored the following occurs:

a. A check is made to see if transgenerations are desired. The TRANSGEN-PROCESS is called if so desired.

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b. A check is made to see if limited slection is desired. LIMIT-PROCESS is called if so desired.

c. The print line is set up and printed field by field up to the end of the print fields specified. If the line did not pass limit criteria, the line for that hour is left blank. Code to surpress repetitive items of the date is also used in this section.

7. The process returns to step 5 until the end of the report as specified by date cards or the end of the AQDHS file. The files are then closed and the program terminated.

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APPENDIX 5

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Requirements for Data Guidance

Program Number ENV017 Name Data Report Program AQDHS Section Name Air Quality

Application System Environmental(ENV)

Date 14 Oct., 1977

Status of this release:

● New ○ Modification

- ● System Flow Chart
- ○ Programming Assignment Sheet
- ● Formats
- ● Description of Data Control Cards
- ● Halts and Messages
- ● Balancing and Controls
- ● Sample JCL
- ○ Hardware/Software Requirements

Location:

DSNAME TM.ENV.LOADLIB

Volume SYS003 Expiration Date

Input Files:

	DDNAME	BLOCK SIZE	DSNAME	ORIGIN*	MAXIMUM FILE SIZE	FILE RETENTION
1.	CARDIN	80/80	Control Card Input			
2.	AQDHSIN	VSAM	SAROAD Data Base			
3.						
4.						
5.						

Output Files:

	DDNAME	BLOCK SIZE	DSNAME	DESTINATION*	MAXIMUM FILE SIZE	FILE RETENTION
1.	REPORT	133/133	Data Report			
2.	SYSPRINT	133/133	Control & Message Report			
3.						
4.						
5.						
6.						
7.						
8.						

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Rev. 7/74 Page 1 of 2

*Document, Program, or Department. Specify "plotter" if applicable.

Requirements for Data Guidance (Program Number ENV017) Date 14 Oct., 1977

Output Distribution Requirements:

- ○ Run on standard 1-part paper (Form No. 13158.16)
- ● Run on Form No. _____, ___-part paper

As requested

Copies will be distributed to:

Sorts:

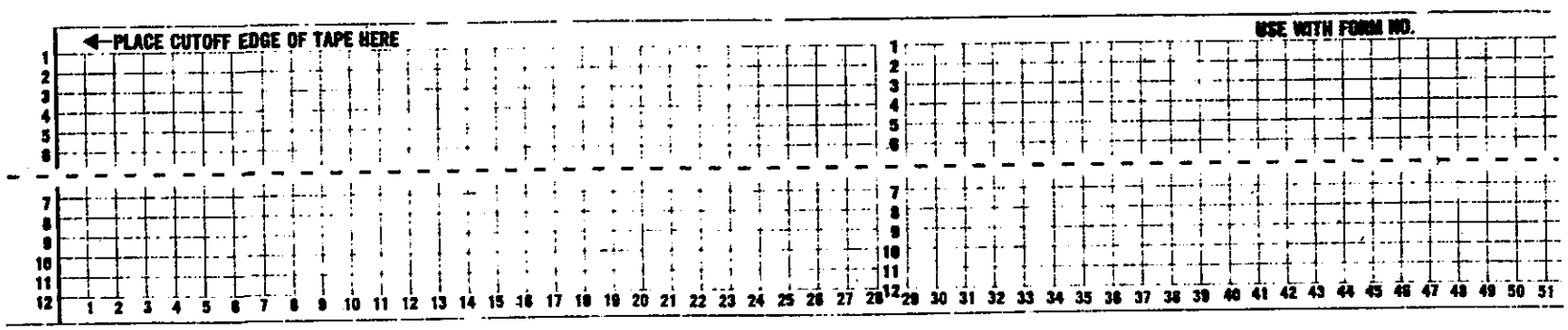
90

Frequency:

- ○ One time only
- ○ Daily
- ○ Semi-weekly
- ○ Weekly
- ○ Semi-monthly
- ○ Monthly
- ○ Quarterly
- ○ Semi-annually
- ○ Annually
- ● On request
- ○ Other _____

Carriage Control Tape:

- ● Standard
- ○ As Shown



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Sample JCL ENV017

```
//T_ENV___ JOB (T_100P,____,_____,____L),name,CLASS=_,REGION=190K
//STEP1  EXEC  PGM=ENV017
//STEPCAT  DD  DSN=TRUCATO1,DISP=SHR
//STEPLIB  DD  DSN=TM.ENV.LOADLIB,DISP=SHR
//         DD  DSN=SYS2.PLILIB,DISP=SHR
//AQDHSIN  DD  DSN=TRUCATO1.T_.--------------------,DISP=SHR,
//              AMP=AMORG,VOL=SER=______,UNIT=3330-1
//CARDIN   DD  *
     Control Card Input
//REPORT   DD  SYSOUT=A
//SYSPRINT DD  SYSOUT=A
/*
```


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FORMAT DESCRIPTION

DATE	ORIGINATOR	REVIEWER
14 Oct 77	JWF	

ENV019 AQDHS Update Program

PROGRAM ORIGINATING FORMAT (NUMBER, FILE CODE, AND NAME)

FILE NAME TRUCATC1.T FORMAT TITLE SAROAD

Area Code	Site Code	Parameter Code	Methods Code	Year Code	Month Code	Day Code	Units Code	Decimal Code	Hour 0	Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour10	Hour11	Hour12	Hour13	Hour14
									Hourly Data Fields														

Hour15	Hour16	Hour17	Hour18	Hour19	Hour20	Hour21	Hour22	Hour23	EOR
Hourly Data Fields									

MODE: BINARY (B)

LABELS: STANDARD ☒

RECORD FORMAT: FIXED-F ☐ VARIABLE-V

RECORD LENGTH 68

RECORDS PER BLOCK VSAM

BLOCK SIZE

INPUT ☒

OUTPUT ☒

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RIGHT
LEFT

ENV017 Identification Card

Card ID	Site Description	Area Code	Site Code	Remarks
ENV017				

12 X

12 X

14 Oct., 1977
JWF

DAS-CS 90-059

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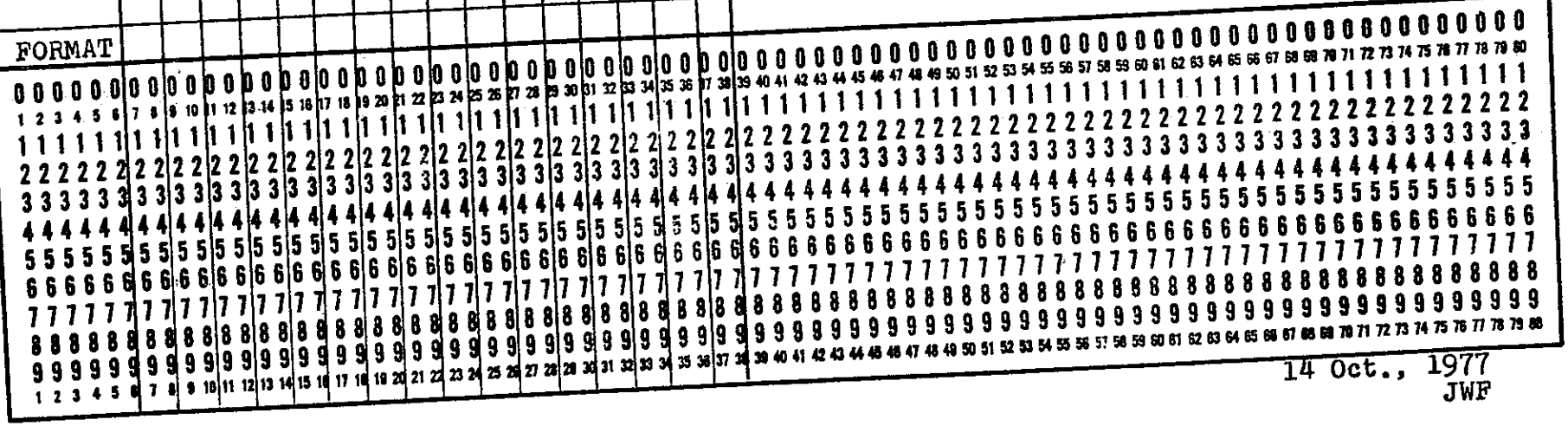
RIGHT
LEFT

ENV017 Format Card

Card ID	Fld 1	Fld 2	Fld 3	Fld 4	Fld 5	Fld 6	Fld 7	Fld 8	Fld 9	Fld10	Fld11	Fld12	Fld13	Fld14	Fld15	Fld16	Blank
	Format Descriptor Fields																

12
X

FORMAT



14 Oct., 1977
JWF

Each two character print field contains the following:
1st char - a 6 or blank (if 6, this represents a 6 character print field
if blank, the field is ignored.)
2nd char - a numeric value 0 through 4 or blank
(if the 1st char has a '6', this position should be filled with
the numeric value which corresponds to the number of digits in
the print field which are to the right of the decimal point;
if the 1st char is blank, this char should also be blank.)

Note: The number of fields filled in must correspond to the number of Output Variable Cards.

RIGHT
LEFT

ENV017 Input Variable Card

Card ID	Input Var. No.	Parameter Code	Methods Code	Site No.	Blank
INVARØ					

12 X

12 X

14 Oct., 1977
JWF

Note: The site code used on this card should correspond to the actual site designation for the parameter desired. Some of the files used the 2nd & 3rd digit of the site code to designate the probe number within the site, i.e. 101, 102, ..., 115 for probes 1 thru 15 of site 1.

DAS-CS 90-059

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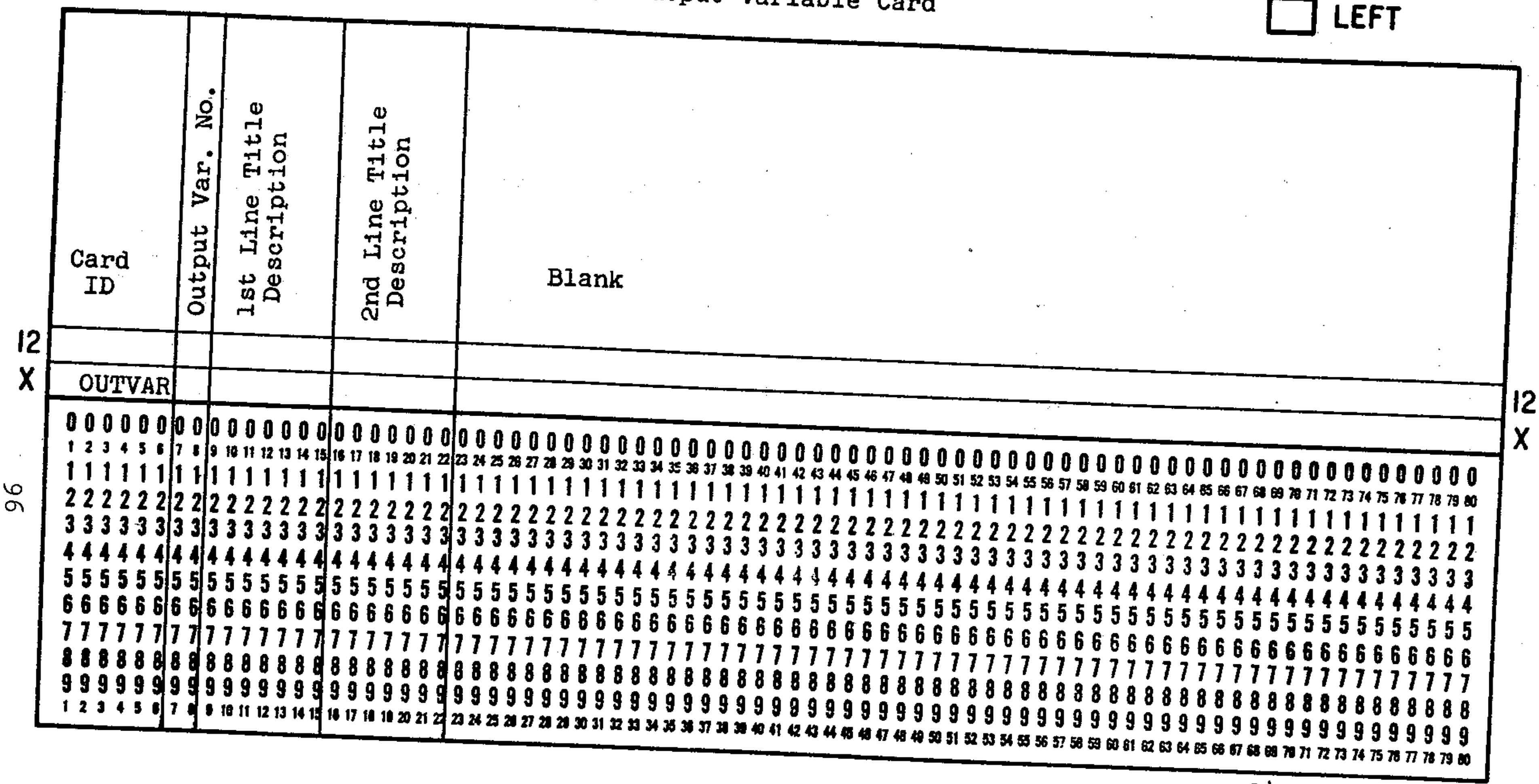
RIGHT
LEFT

ENV017 Output Variable Card



Output variables are printed in the same order in which the OUTVAR Cards are read.

14 Oct., 1977
JWF

The Output Var. No. corresponds to either an Input Var. No. or a new Transgenerated Var. No.

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RIGHT
LEFT

ENV017 Date Card

Card ID	Year	Month	Day	Hour	Blank
12					
X DATEØØ					

14 Oct., 1977
JWF

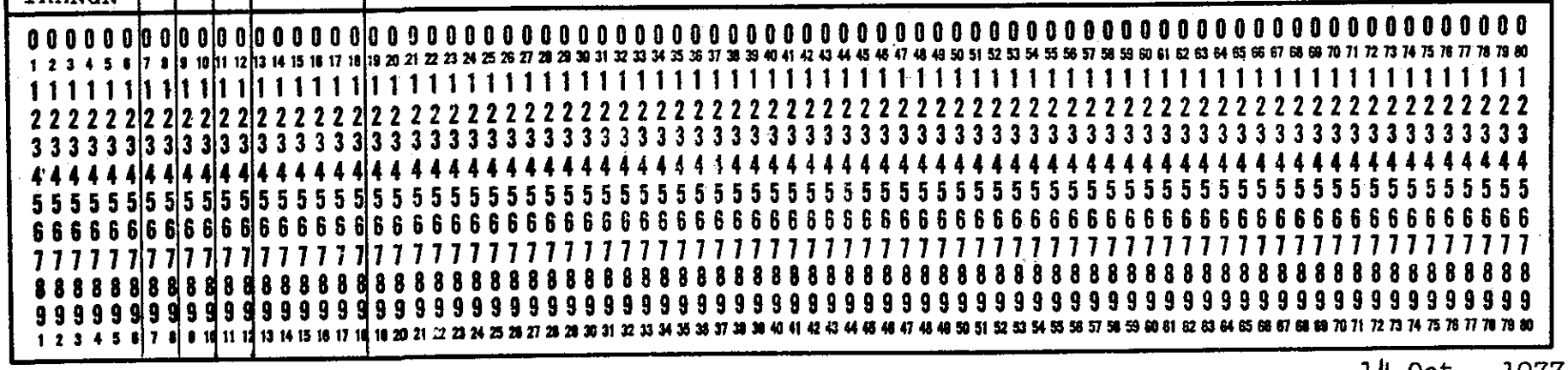
Note: A 99 in Month will scan all 12 months.
A 99 in Day will scan all 31 days.
A 99 in Hour will scan all 24 hours.

Ex.) 77990599 will scan every hour of the 5th day of every month.

RIGHT
LEFT

ENV017 Transgeneration Card

Card ID	Transgeneration Code	Variable No. X_k	Variable No. X_1	Variable No. X_j or Constant C	Blank
12					
X TRANGN					



14 Oct., 1977
JWF

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RIGHT
LEFT

ENV017 Limit Card

Card ID	Variable No.	Range 1		Range 2		Range 3		Blank
		Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	
12 X								12 X
LIMITØ								

14 Oct., 1977
JWF

Variable No. corresponds to either the Input Variable No. or a new Transgenerated Variable No.

Any Range may be left blank. If it is, then both the upper and lower limits are zero. Thus values of zero in the data will be selected, if any.

Values which fall within any of the Limit Ranges will be selected.

Variable No. 99 is a special number which will allow selection by hour ranges.

DAS-CS 90-059

Sample Control & Message Report - ENV017

```
CONTROL CARDS AND ERROR MESSAGES                ENV017 AIR QUALITY DATA REPORT          COMPILED 10-04-77 BY J. FAULKINBURY

ENV017 TEST SITE
FORMAT62626361636262362          DESCR4180001RMKS  TEST RUN OF ENV017
INVAR 014210111101
INVAR 024210111102
INVAR 037560011101
INVAR 047570011101
INVAR 057600011101
OUTVAR01    CO  PROBE1
OUTVAR02    CO  PROBE2
OUTVAR03  CUPU  PROBE1
OUTVAR04  HUMD  PROBE1
OUTVAR05  DELT  PROBE1
OUTVAR06 SQ RT   VAR 1
OUTVAR07  EXP    VAR 6
OUTVAR08 VAR 6   *8.5
OUTVAR09 VAR 1   *VAR 6
DATE  74059999
TRANGN010601
TRANGN040706
TRANGN070806    8.5
TRANGN110901000006
```


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ENV017 AIR QUALITY DATA REPORT

COMPILED 10-04-77 BY J. FAULKINBURY

SITE 001 TEST SITE

RUN DATE: 77/10/07

REMARKS: RMKS TEST RUN OF ENV017

YR	MO	DA	HR	CO PROBE1 42101 11 1	CO PROBE2 42101 11 2	CUPU PROBE1 75600 11 1	HUMD PROBE1 75700 11 1	DELT PROBE1 76000 11 1	SQ RT VAR 1	EXP VAR 6	VAR 6 *8.5	VAR 1 *VAR 6
74	5	7	21									
			22									
			23									
		8	0									
			1									
			2									
			3									
			4									
			5	12.29	12.55	1.766	98.6	0.079	3.506	33.31	29.799	43.09
			6	21.56	20.69	1.344	98.7	0.055	4.643	103.88	39.468	100.11
			7	18.67	16.46	1.808	97.6	0.055	4.321	75.25	36.727	80.67
			8	17.44	14.92	1.532	98.2	0.078	4.176	65.11	35.497	72.83
			9	13.61	11.73	1.352	91.6	0.030	3.689	40.01	31.358	50.21
			10	13.51	12.73	1.739	82.8	0.194	3.676	39.47	31.243	49.66
			11	14.97	12.20	2.022	73.1	0.201	3.869	47.90	32.887	57.92
			12	12.01	9.81	3.255	71.4	0.200	3.466	31.99	29.457	41.62
			13	12.07	10.81	2.845	69.5	0.131	3.474	32.27	29.531	41.93
			14	14.85	13.09	3.131	68.4	0.166	3.854	47.16	32.755	57.23
			15	14.45	12.99	3.535	70.4	0.158	3.801	44.76	32.311	54.93
			16	17.86	14.65	4.544	78.2	0.177	4.226	68.45	35.922	75.48
			17	13.11	12.95	3.928	84.9	0.122	3.621	37.37	30.777	47.47
			18	10.08	9.27	2.987	87.8	0.092	3.175	23.92	26.987	32.00
			19									
			20									
			21									
			22									
			23									
		9	0									
			1									
			2									
			3									
			4									
			5	13.34	14.34	1.545	90.4	0.054	3.652	38.57	31.045	48.72
			6	19.28	20.15	1.717	85.5	0.046	4.391	80.71	37.323	84.66
			7	17.17	16.70	2.060	81.2	0.065	4.144	63.03	35.221	71.15
			8	13.11	13.44	2.223	77.2	0.093	3.621	37.37	30.777	47.47
			9	12.10	11.60	2.503	74.8	0.145	3.479	32.41	29.567	42.09
			10	11.19	11.60	2.311	72.2	0.127	3.345	28.36	28.434	37.43
			11	11.30	11.40	2.053	68.9	0.141	3.362	28.83	28.573	37.99

Sample Data Report - ENV017

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ENV017 AIR QUALITY DATA REPORT COMPILED 10-04-77 BY J. FAULKINBURY

SITE 001 TEST SITE

RUN DATE: 77/10/07 REMARKS: RMKS TEST RUN OF ENV017

YR	MO	DA	HR	CO PROBE1 42101 11 1	CO PROBE2 42101 11 2	CUPU PROBE1 75600 11 1	HUMD PROBE1 75700 11 1	DELT PROBE1 76000 11 1	SQ RT VAR 1	EXP VAR 6	VAR 6 *8.5	VAR 1 *VAR 6
74	5	31	3									
			4									
			5	14.48	13.57	1.091	84.6	0.039	3.805	44.94	32.345	55.10
			6	20.66	18.38	1.413	82.8	0.053	4.545	94.19	38.635	93.91
			7	18.25	17.75	1.305	77.3	0.050	4.272	71.66	36.312	77.96
			8	14.08	12.45	1.639	75.8	0.074	3.752	42.62	31.895	52.83
			9	12.65	10.64	2.848	72.9	0.140	3.557	35.05	30.232	44.99
			10	14.39	11.70	2.409	74.7	0.121	3.793	44.41	32.244	54.59
			11	15.80	13.02	2.888	76.0	0.111	3.975	53.25	33.787	62.80
			12	15.36	13.03	2.228	72.8	0.124	3.919	50.36	33.313	60.20
			13	15.35	12.10	2.717	66.9	0.136	3.918	50.30	33.302	60.14
			14	17.11	14.39	3.684	67.9	0.160	4.136	62.58	35.160	70.77
			15	18.36	12.05	4.452	69.2	0.239	4.285	72.59	36.421	78.67
			16	16.20	14.27	4.525	71.4	0.256	4.025	55.98	34.212	65.20
			17	13.90	10.35	4.626	80.2	0.173	3.728	41.61	31.690	51.82
			18	13.16	11.29	3.966	86.0	0.089	3.628	37.63	30.835	47.74
			19									
			20									
			21									
			22									
			23									
	N			308	308	308	308	308	308	308	308	308
	MEAN			14.06	12.35	3.040	70.1	0.156	3.725	45.51	31.664	53.71

VARIABLE	STANDARD DEVIATION
1	3.218E+00
2	2.960E+00
3	1.168E+00
4	1.277E+01
5	8.330E-02
6	4.229E-01
7	2.097E+01
8	1.596E+00
9	1.865E+01

Sample Data Report - ENV017

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