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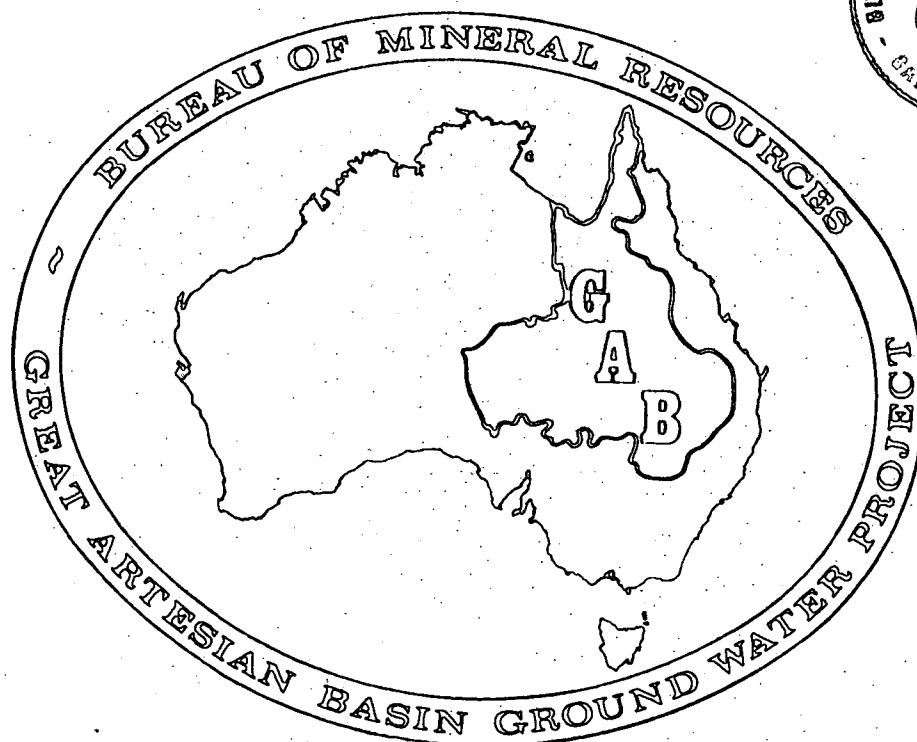
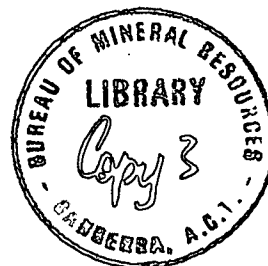
BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

RECORD 1973/203

DATA CHECK PROGRAMS FOR THE GREAT ARTESIAN BASIN ADP SYSTEM

by

G. KREBS*



*Bureau de Recherches Géologiques et Minières

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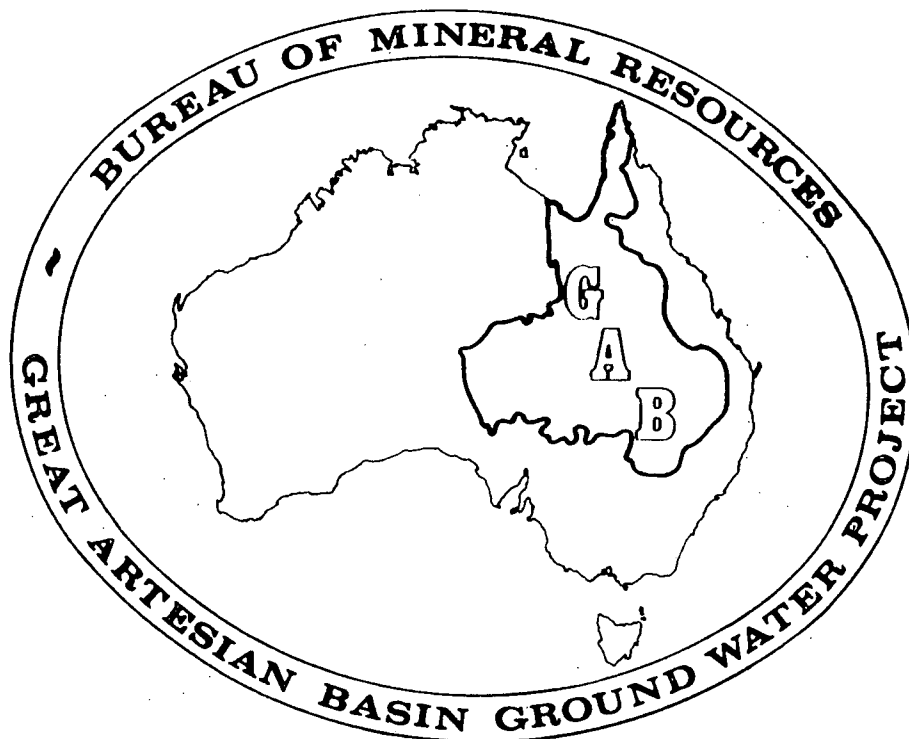
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APPENDIX

1	Listing of program TES4A
2	Listing of program TES4B
3	Listing of program TES4C
4	Listing of program TES4D
5	Listing of program TES4E
6	Listing of program TES4F
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10	Listing of program TES4K
11	Listing of program COVET

FIGURES

Figure 1 and 2	: Outline of the data cards organization
Figure 3	: Check operations of input data
Figure 4	: Flow chart of horizontal check programs
Figure 5	: Flow chart of subroutine VECOSU
Figure 6	: Flow chart of program COVET

SUMMARY

This Record describes FORTRAN IV computer programs which can be used to detect most of the errors typically made during the transcription and punching of data onto cards for the Great Artesian Basin Automatic Data Processing, Storage, and Retrieval System.

Application of these checking programs greatly reduces the time spent on the correction and processing of the data at later stages.

1. INTRODUCTION

This is the second report dealing with the Great Artesian Basin (GAB) automatic data processing (ADP) system. The first report (Ungemach & Habermehl, 1973) described the scope of the ADP system and Stage 1 of the project, the organization of data on punch cards. This report describes a series of programs designed to detect errors in data transcription. As such it represents Stage 2 of the development of the GAB-ADP system.

The efficient use of the data card files and the straight forward operation of programs depends on the quality of the transcription of the data from the inventory of hydrological data of the Great Artesian Basin to punch cards. The accuracy and compatibility of the information on the cards must therefore be ensured. Manual checking of the data from 4000 wells is time-consuming and often impossible when the data relating to one well are recorded on a number of separate cards. For these reasons it has been necessary to develop programs for the detection of logical errors in the data.

1.1 ORGANIZATION OF DATA ON CARDS

The GAB-ADP system uses data from artesian wells only. The basic data are abbreviated or coded on transfer sheets, and the information is then punched on 80-column punch cards.

The organization of data on cards (Figs. 1 and 2), described already by Ungemach & Habermehl (1973), is suited to the requirements of the final model and not necessarily to the requirements of an independent data storage and retrieval system. Information related to one well may necessitate the use of several punch cards with the same well number. The various cards, of which only the master card is strictly necessary, prepared for each well are listed below:

4A	master
4B	well casing and screen
4C	lithostratigraphy
4D	aquifer description
4E	well discharge
4F	well production
4G	head and temperature
4H	well hydrodynamics
4I	pumping and flow test
4J	well characteristic curve
4K	total dissolved solids
4L	water chemistry - card 1
4M	water chemistry - card 2

2. THE FUNCTION OF CHECKING PROGRAMS

2.1 SEQUENCE OF OPERATIONS

The initial acquisition of data is such that the cards, when first punched, are already sorted according to State and card type (Fig. 3). Before the checking programs can be used the cards are further organized according to 1:250 000 Sheet and well-number; the cards are arranged in increasing well-number and where there are several cards relating to the same well the arrangement is by increasing folio number. A listing of the cards is then performed so as to facilitate the recording of errors. Verification of the data recorded on each card type can then be made using the horizontal checking programs TES4A, TES4B, TES4C, etc. After correction of any errors detected, the data must be further checked using the vertical check program COVET.

If errors have been detected, a second run is necessary to check the validity of the correction.

2.2 HORIZONTAL CHECKING PROGRAMS

Horizontal checking programs check cards of the same type for various wells. They detect errors such as the incorrect latitude or longitude of a well. Not all errors will, however, be detected. For example, the latitude and longitude for a well can be checked against the 1:250 000 Sheet area quoted for it; but a mistake of a few minutes may not be detected. Similarly, at this stage a wrong well number will not be detected if the number is within the interval of well numbers defined for the map sheet. This will, however, be detected by the vertical check program COVET. Fundamental errors due, for example, to the misinterpretation of a geological section will never be detected by either horizontal or vertical checking programs.

At the time of writing, the only horizontal checking programs which have been run with actual data are TES4A, TES4B, TES4D, and TES4E. The other horizontal programs have been tested with arbitrary data only.

2.3 VERTICAL CHECKING PROGRAM

The vertical checking program COVET checks all cards related to one well. It checks the card file for the compatibility of the data recorded on different types of cards for a single well, and compares the data cards to the card availability section on the master card. It can detect errors such as a wrong well number even if the number is within the interval of numbers defined for the Sheet area. The program has been checked with actual data.

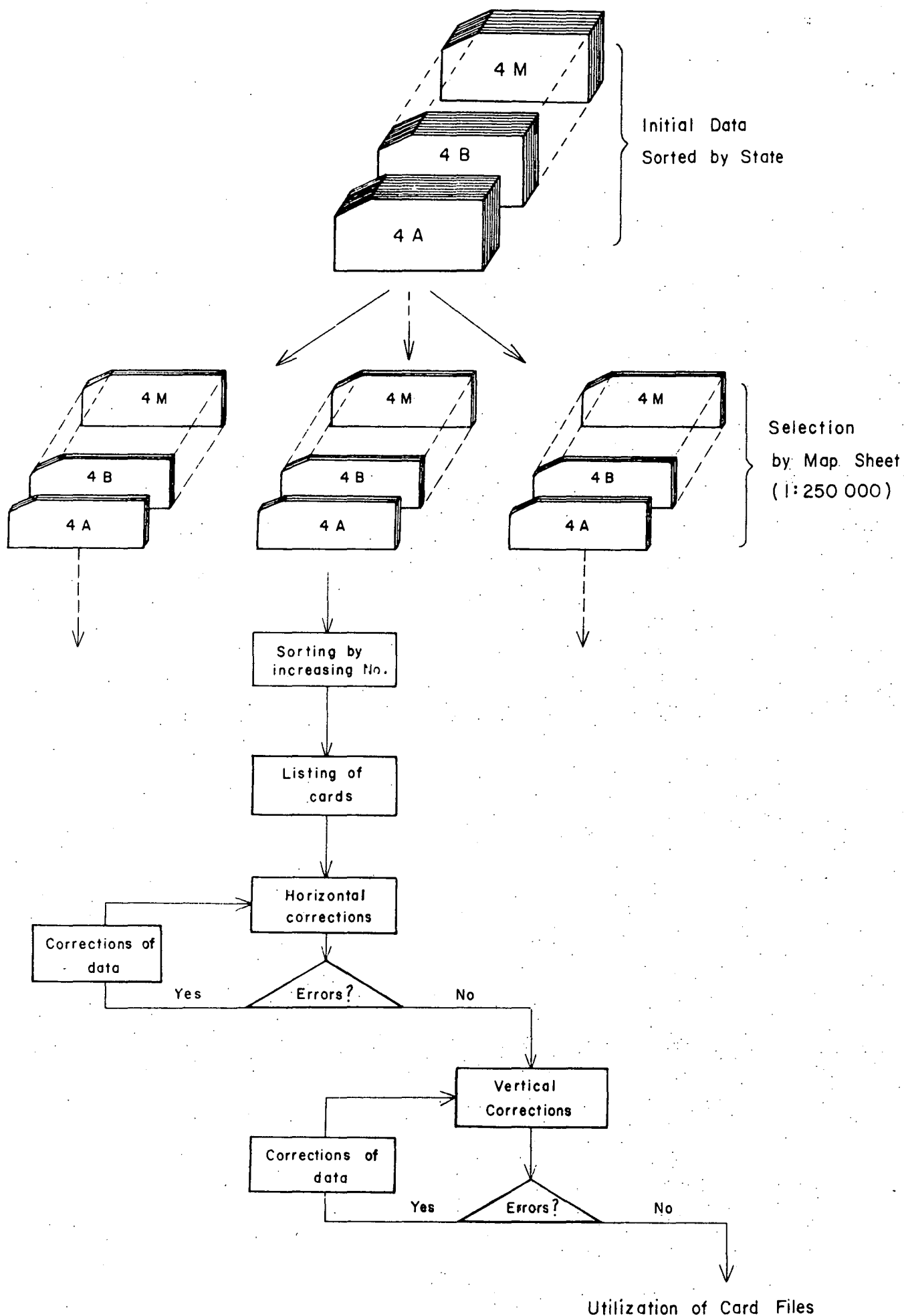
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OUTLINE OF DATA CARDS ORGANISATION

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Fig.3

CHECK OPERATIONS OF INPUT DATA



3. DETAILS OF HORIZONTAL PROGRAMS

3.1 PROGRAM TES4A

3.1.1 Scope. The data punched on the card 4A, the master card, are checked by program TES4A. A listing of the program is presented in Appendix 1.

3.1.2 Items checked. The following items are checked during the operations of the program:

- (a) card code;
- (b) well identification and location:
 - State in which the well is located
 - letter and number of the 1:1 000 000 Sheet, and number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - determination of the well number inside the interval of well numbers corresponding to the Sheet
 - determination of the well location in latitude and longitude within the limits of the Sheet
 - accuracy of the well location;
- (c) elevation of the well (within the interval of maximum and minimum elevations shown on the Sheet) and the accuracy of the elevation measurement;
- (d) depth of the well, i.e. total depth drilled (equal to or less than the maximum depth drilled in the Sheet area);
- (e) date of drilling (between the first and the last date of drilling in the Sheet area);
- (f) type of well and its use;
- (g) presence or absence of geophysical and geological logs;
- (h) number and type of data cards available for the well (to be an integer);
- (i) absence of duplicate well numbers in the card file.

3.1.3 Parameter cards. The number of parameter cards read before the data cards may vary depending on the number of Sheets processed; only the second and third cards do not vary.

Card 1 records the number of 1:250 000 Sheet to be checked. The reading format is I2.

e.g. if two Sheets are to be checked 2

Card 2 records the list of letters and numerals which have been used to define the well type and use. The reading format is 36A1.

Card 3 records integers used to check information which is recorded only by number. The reading format is 11A1

e.g. 0 1 2 3 4 5 6 7 8 9

Card 4 records the card code, the code number of the State in which the well is located, the last letter of the 1:1 000 000 Sheet index, the number of the 1:100 000 Sheet and the 1:250 000 Sheet, and the code for the end of cards

e.g. 4 A 4 G 5 5 9 * *

where 4A represents code for master card

4	"	"	"	State
G	"	"	"	ordinate index for 1:1 000 000 Sheet
55	"	"	"	absissa " " 1:1 000 000 Sheet
9	"	"	"	the number of the 1:250 000 Sheet
**	"	"	"	the end of card set

Card 5 records the highest and lowest numbers of wells in the Sheet area being checked. The reading format is 2I5

e.g. 2 0 1 8 0 0

where 20 is the lowest number and 1800 is the highest.

Card 6 records the co-ordinates of boundaries for the Sheet being checked; these are expressed in degrees, minutes, and seconds. The reading format is 4(F3.0, 2F2.0)

1 5 0 0 0 0 0	1 5 1 3 0 0 0	2 6 0 0 0 0	2 7 0 0 0 0
Mini. Long	Maxi. Long	Mini. Lat.	Maxi. Lat.

Card 7 records the maximum and minimum ground surface elevations expressed in 1/10 of a foot. The reading format is 2F5.0

1 0 0 0 3 0 0 0

where 1000 is the minimum altitude (100.0 ft)
3000 is the maximum altitude (300.0 ft)

Card 8 records the maximum and minimum depths (drilled) in feet, of wells in the 1:250 000 Sheet area. The reading format is 2F5.0

e.g. 5 0 0 2 5 0 0

where 500 is the minimum depth
2500 is the maximum depth

Card 9 records the limits for the completion (drilling) dates of the wells. The reading format is 2(I3, I2)

e.g. 8 9 0 1 9 7 2 1 2

where 890 1 is January 1890
97212 is December 1972.

The cards numbered from 3 to 9 are repeated for each 1:250 000 Sheet. These cards are separated from the preceding data cards by a card which indicates the end of a data card file. The data recorded on cards 5, 7, 8, and 9 can be approximate as long as the real figures are within the interval shown.

3.1.4 Subroutine used. The program includes a subroutine (BCDERSET) which is used to prevent the termination of program execution when a format incompatibility between a data card and the reading FORTRAN statement is encountered.

3.2 PROGRAM TES4B

3.2.1 Scope. The data punched on the well casing and screen card are checked by the program TES4B (Appendix 2).

3.2.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where well is located
 - letter and number of the 1:1 000 000 Sheet, and number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) diameters of the drill hole and casing (the first figure being larger than the second);
- (d) code corresponding to the nature of the equipment in the hole
- (e) code referring to the type of material of the equipment in the hole;
- (f) depths of the casing and cementing (the depths marked 'to' must be greater than the depths marked 'from');
- (g) code defining the method of drilling;
- (h) code referring to possible corrosion of the equipment;
- (i) year of completion (drilling);
- (j) compatibility between the well numbers and the card continuation code (Code 1: the number of the well on the next card is the same; Code 0: the number of the well on the next card is different).

3.2.3 Parameter cards. As before, the number of parameter cards depends on the number of Sheets to be checked:

Card 1 records the number of 1:250 000 Sheets to be checked. The reading format is I2.

Card 2 records integers used to check information which is recorded only by number. It is identical to the third card of the TES4A program, irrespective of the number of Sheets tested.

Card 3 is identical to the fourth card of the TES4A program.

Card 4 is identical to the fifth card of the TES4A program.

Card numbers 3 and 4 must be repeated for each Sheet to be checked.

3.2.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU: checks the compatibility between the card continuation code and the well number.

3.3 PROGRAM TES4C

3.3.1 Scope. The geological (lithostratigraphical) section of the borehole is recorded on the '4C' cards which are checked with the program TES4C (Appendix 3).

3.3.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) depth (increasing) of the top of each lithostratigraphic unit described;
- (d) codes (2, 3, or 4-digit alphabetic symbols) used for the identification of the lithostratigraphic units;
- (e) compatibility between the well numbers and the card continuation code.

3.3.3 Parameter cards. At least five parameter cards are present:

Card 1 records the number of 1:250 000 Sheets to be checked.

Card 2 is identical to the third card of program TES4A.

Card 3 records the letters in a specific order. The reading format is 27A1 e.g.

C D E J K O P Q S T A B F G H I L M N R U V W X Y Z

Card 4 and Card 5 are identical to the fourth and the fifth card of the program TES4A. These cards have to be repeated when there is more than one 1:250 000 Sheet to be checked.

3.3.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.4 PROGRAM TES4D

3.4.1 Scope. The description of the aquifers penetrated by the well is recorded on the 4D cards. Data on these 4D cards are checked by the program TES4D (Appendix 4).

3.4.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1: 1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number
- (c) depths (increasing) for the top and bottom of the various aquifers penetrated;
- (d) depth at which water was encountered during drilling, or depth at which production tests have been made (depth must be between the top and bottom depth of the aquifer);
- (e) code for the lithostratigraphic unit to which the aquifer belongs;
- (f) information regarding the permeability of the aquifer:
 - permeability class code
 - origin of the permeability determination
 - reliability of the permeability information;
- (g) existence of free flow (artesian) or non-flow (subartesian) conditions;
- (h) compatibility between the well numbers and the card continuation code.

3.4.3 Parameter cards. The number of parameter cards read before the data cards may vary depending on the number of Sheets processed:

Card 1 is identical to the first card of TES4A program.

Card 2 is identical to the third card of program TES4A.

Card 3 records the letters of the alphabet in the right order. The reading format is 27A1.

Card 4 records the signs '+' and '-' in column one and two.

Cards 5 and 6, which are specific for each Sheet, are identical to the fourth and fifth cards of the program TES4A.

3.4.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.5 PROGRAM TES4E

3.5.1 Scope. The various discharge measurements associated with the measurement of dynamic levels are recorded in cards 4E. Data on these cards are checked by the program TES4E (Appendix 5).

3.5.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) code about the well measurement information:
 - 1 discharge measurement from a single well
 - 2 discharge measurement from a group of wells;
- (d) reliability of the aquifer code number;
- (e) date of the well discharge measurement (dates in increasing order);
- (f) discharge measurement records (numbers only);
- (g) dynamic level or pressure measurement records (numbers only) and the unit used;
- (h) type of flow;
- (i) code for changes of outlet elevation;
- (j) compatibility between the well numbers and the card continuation code.

3.5.3 Parameter cards. At least six parameter cards are used:

Card 1 is identical to the first card of program TES4A.

Card 2 is identical to the third card of program TES4A.

Card 3 records the signs '+' and '-' in the first two columns.

Card 4 contains the codes corresponding to the type of flow. The reading format is 5A2.

e.g.

N	L	F	F	C	F	P	F	C	D
---	---	---	---	---	---	---	---	---	---

Cards 5 and 6, which are repeated for each 1:250 000 Sheet, are identical to the fourth and fifth cards of the program TES4A.

3.5.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.6 PROGRAM TES4F

3.6.1 Scope. The production (flow or discharge) history of a well is recorded on cards 4F. Data on these 4F cards are checked by the program TES4F (Appendix 6).

3.6.2 Items checked. The following items are checked during the operations of the program:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) years for which the production is given (in increasing order);
- (d) production period or time interval during which the well has been producing water;
- (e) type of flow;
- (f) compatibility between the card continuation code and the well numbers.

3.6.3 Parameter cards. At least five parameter cards are used:

Card 1 records the numbers of 1:250 000 Sheets to be checked.

Card 2 is identical to the third card of program TES4A.

Card 3 is identical to the fourth card of program TES4A.

Cards 4 and 5, which are specific for each 1:250 000 Sheet, are identical to the fourth and fifth cards of program TES4A.

3.6.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.7 PROGRAM TES4G

3.7.1 Scope. Water levels (head or pressure) and temperature measurements are recorded on 4G cards. These data are checked by the program TES4G (Appendix 7).

3.7.2 Items checked. The following items are checked:

- (a) code card;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) measurement dates, in increasing order;
- (d) water-level and temperature measurements and the units used for these measurements;
- (e) reference levels (ground surface elevation) for the water-level measurements;
- (f) code indicating the reliability of the measurements;
- (g) compatibility between the card continuation code and the well numbers.

3.7.3 Parameter cards. Five parameter cards have to be used:

Card 1 records the number of 1:250 000 Sheets to be checked.

Card 2 is identical to the third card of program TES4A.

Card 3 contains the signs '+' and '-' in columns 1 and 2.

Cards 4 and 5, repeated for each 1:250 000 Sheet, are identical to the fourth and fifth cards of program TES4A.

3.7.4 Subroutines used.

- (a) BCDERSET
- (b) VECOSU

3.8 PROGRAM TES4H

3.8.1 Scope. Hydrodynamic test characteristics and test results are recorded on cards 4H. Data on these 4H cards are checked by the program TES4H (Appendix 8).

3.8.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) depth of the perforated casing;
- (d) depth of the tapped aquifer;
- (e) interpretation method for the test;
- (f) value of the transmissivity and the storage coefficient;
- (g) compatibility between the card continuation code and the well numbers.

3.8.3 Parameter cards. At least five cards have to be used:

Card 1 records the number of 1:250 000 Sheets to be checked.

Card 2 is identical to the third card of program TES4A.

Card 3 records all the letters of the alphabet in the normal order.

Cards 4 and 5 are identical to the fourth and fifth cards of the program TES4A. These two cards have to be repeated when there is more than one 1:250 000 Sheets to be checked.

3.8.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.9 PROGRAM TES4I

3.9.1 Scope. Flow and pressure data are recorded on cards 4I. These data have to be collected when no test results are known or reported on cards 4H; they are checked with the program TES4I (Appendix 9).

3.9.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;

- (c) type of the test performed;
- (d) pressure and discharge measurements before the test starts;
- (e) code of the unit in which the pressure measurements are recorded;
- (f) date of completion of the test;
- (g) increasing time at which the measurements have been made;
- (h) coherence between the type of the test performed and the nature of the measurement;
- (i) compatibility between the card continuation code and the well numbers.

3.9.3 Parameter cards. The five parameter cards are the same as those used for the program TES4H:

Card 1 records the number of 1:250 000 Sheets to be checked.

Card 2 is identical to the third card of program TES4A.

Card 3 records all the letters of the alphabet.

Cards 4 and 5 are identical to the fourth and fifth cards of the program TES4A, and are specific for each 1:250 000 Sheet.

3.9.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.10 PROGRAM TES4K

3.10.1 Scope. Measurements of the total amount of dissolved solids in the water of the wells are recorded on cards 4K. Program TES4K (Appendix 10) checks the validity of these data.

3.10.2 Items checked. The following items are checked:

- (a) card code;
- (b) well identification and location:
 - State where the well is located
 - letter and number of the 1:1 000 000 Sheet, and the number of the 1:250 000 Sheet on which the well is located
 - possible deepening of the well during its lifetime
 - well number;
- (c) measurement unit for expressing total dissolved solids;
- (d) year of measurement (increasing order);
- (e) compatibility between the card continuation code and well numbers.

3.10.3 Parameter cards. The parameter cards are the same as those used for the program TES4B.

Card 1 records the number of 1:250 000 Sheets to be checked.

Card 2 is identical to the third card of program TES4A.

Cards 3 and 4, repeated for each Sheet, are identical to the fourth and fifth cards of program TES4A.

3.10.4 Subroutines used

- (a) BCDERSET
- (b) VECOSU

3.11 CARD DECK ORGANIZATION

3.11.1 CDC 3600. The card deck order for the application of the set of previous, described programs on the CDC 3600 computer of CSIRO, Canberra, is as follows:

- (a) *JOB, CCDMR* WC, name, t⁽¹⁾
- (b) *KTN, X, L
- (c) PROGRAM name⁽²⁾
- (d) DIMENSION ...
program and subprogram
- (e) END
- (f) SCOPE
- (g) *LOAD
- (h) *RUN, t⁽¹⁾, l⁽³⁾
- (i) first parameter card
(total number of 1:250 000 Sheets to be checked)
- (j) set of parameter cards, which are independant of
the 1:250 000 Sheet number
- (k) set of parameter cards, which are specific for
each 1:250 000 Sheet number
- (l) data cards relevant
- (m) **
- (n) *END

(k), (l) and (m) have to be repeated for each 1:250 000 Sheet which has to be checked.

3.11.2 CYBER 76

When these programs are run on the CYBER 76, the following control cards have to be used:

-
- (1) t = execution time of the program in minutes
 - (2) name = program name
 - (3) l = number of lines to be printed

- (a) *CY, CCDMR *WC, NAME
- (b) NAME (T100, P1000)
- (c) ACCOUNT (CCDMR *WC)
- (d) FTN.
- (e) LGØ.
- (f) 7, 8, 9 in column 1 (end of section card)
PROGRAM NAME (INPUT, OUTPUT, TAPE 60 = INPUT,
TAPE 61 = OUTPUT)

program deck

END

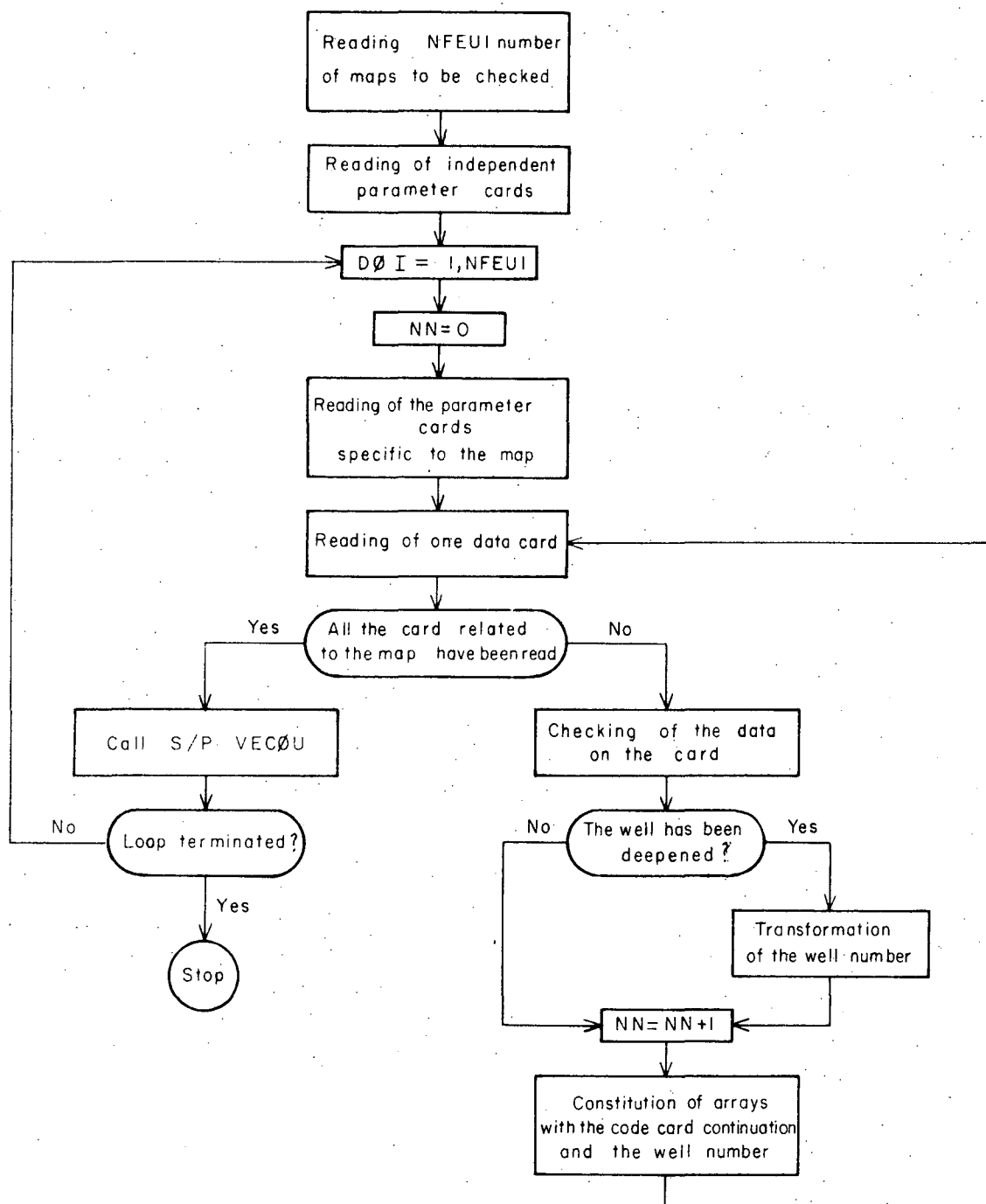
- (g) 7, 8, 9 in column 1; 1 in column 2; 7 in column 3
(end of partition card)
- (h) data (parameter cards in the same order as previously
and data to be checked)
- (i) 6, 7, 8, 9 multipunch in column 1 (end of information card)

Since subroutine BCDERSET is designed to operate on the 3600 computer, the card in the main program deck which calls this subprogram has to be removed, until a comparable library program is available on the CYBER 76.

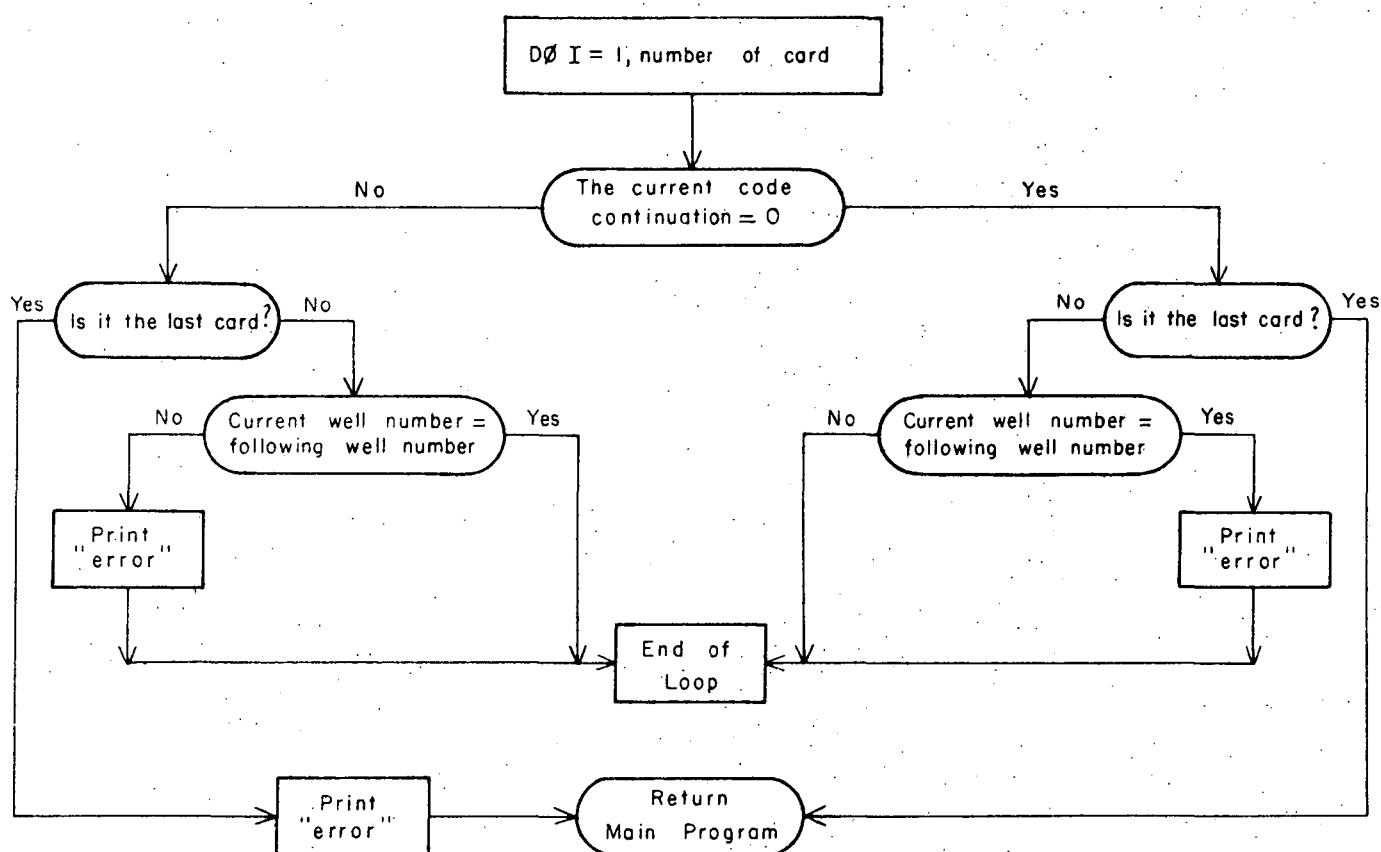
A flow chart showing the general outline for all horizontal check programs is given in Figure 4.

Figure 5 shows the subroutine VECOSU called in these horizontal check programs.

FLOW CHART OF HORIZONTAL CHECK PROGRAMS



S.P. VECOSU



4. VERTICAL CHECK PROGRAM

4.1 PROGRAM COVET

4.1.1 Scope. Program COVET (Appendix 11) checks information related to one well and reported on several card types.

4.1.2 Items checked. The following items are checked during the processing of the program:

- (a) Each well number which appears in the file 4B, 4C,...4K has to be written in the master card set with the same map number;
- (b) The number of cards available as read on card 4A must correspond to the number of punched cards in the appropriate file;
- (c) If several cards are used to record the same kind of information, the folio number must be increasing (see flow chart Fig. 6).

4.1.3 Parameter cards. Two cards are used to run this program:

Card 1 which is independent of the number of 1:250 000 Sheets, records the following items:

- (a) Table of card code except code 4A;
- (b) Table of codes of card types for which the folio number only appears in column 80;
- (c) Code for end of card set.

The reading format is 16A2

4B	4C	4D	4E	4F	4G	4H	4I	4J	4K	4L	4M	4D	4J	4K	**
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Where 4B.....4M corresponds to item (a)
 4D, 4J, 4K corresponds to item (b)
 ** corresponds to item (c)

Card 2: in the first five columns of this card, the number of cards 4A are recorded, and may correspond to one or several 1:250 000 Sheets.

4.2 CARD DECK ORGANIZATIONS

4.2.1 CDC 3600

The card deck order is as follows:

- (a) *JØB, CCDMR, *WC, CØVET, t⁽¹⁾
- (b) program deck
- (c) *RUN, t, 1⁽²⁾
- (d) two parameter cards
- (e) set of cards 4A corresponding to one or several 1:250 000 Sheets
- (f) all other data cards which belong to these Sheets
- (g) **
- (h) *EØD

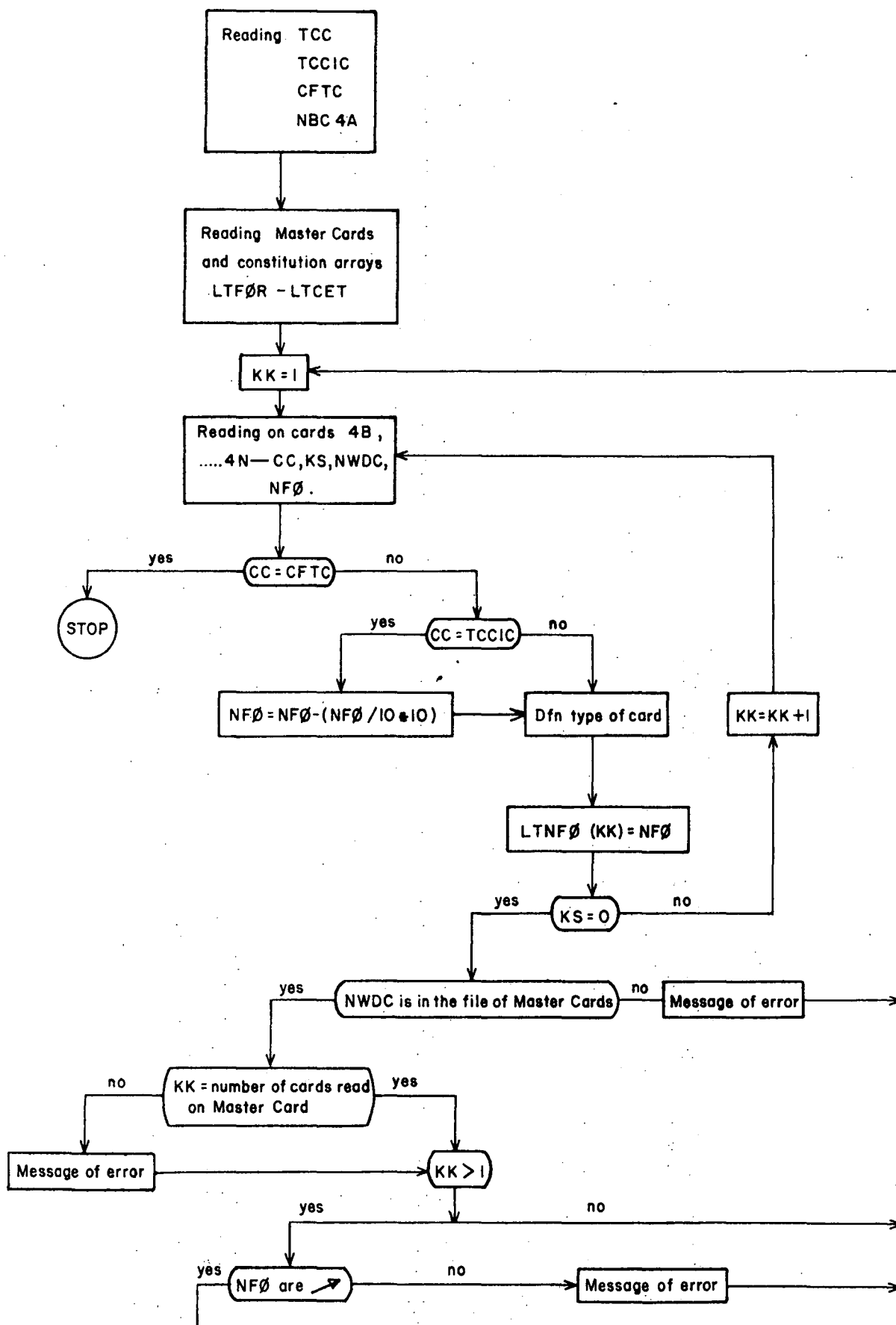
(1) t = execution time of the program in minutes
 (2) 1 = number of lines to be printed

4.2.2 CYBER 76

The use of the CYBER 76 for the vertical check program requires the same control cards as those used for the running of the horizontal check program.

The flow chart of the vertical check program COVET is shown in Figure 6.

FLOWCHART OF PROGRAM CØVET



5. CONCLUSIONS

The checking programs described in this report test the data card file system for errors and incompatibilities. For efficient and successful operations, these programs have to be used in the order described.

The card file can be updated by checking the new cards only. These programs save time at the first stage of data transcription and during the further processing of the data.

6. REFERENCE

UNGEMACH, P., and HABERMEHL, M.A., 1973 - Great Artesian Basin Groundwater Project Automatic Data Processing Storage and Retrieval System. Bur. Miner. Resour. Aust. Rec. 1973/25 (unpubl.).

Appendix 1

Program TES4A

IN	:	logical unit number of the card reader
OUT	:	logical unit number of the printer
NFEUI	:	number of maps which have to be checked
TYUSPC(36*)	:	array of the type and use code
LTN(11)	:	array of integer numbers
CC	:	card code
NSTAT	:	State number
LETPC	:	map letter
MANUB	:	map number
CFTC	:	end of cards code
NUWEL(2)	:	array of extreme values of well numbers
ABMI(3)	:	minimum longitude of the 1:250 000 Sheet
ABMA(3)	:	maximum longitude of the 1:250 000 Sheet
ORDMI(3)	:	minimum latitude of the 1:250 000 Sheet
ORDMA(3)	:	maximum latitude of the 1:250 000 Sheet
GELPC(2)	:	ground elevation (extreme values)
EXDET(2)	:	total depth (extreme values)
LDATEX(2,2)	:	date completed

read on
parameter cards

C4A	:	card code
NSTMC	:	State number
LEITMC	:	map letter
MNMC	:	map number
LDEEP	:	deepening
NWMC	:	well number
RLON(3)	:	longitude
RLAT(3)	:	latitude
LAC(2)	:	accuracy
GREL	:	ground elevation
TOTDE	:	total depth
LDAITMC	:	date of completion of the well
TYUSMC	:	type and use
LGEL	:	availability of geological log
LGEP	:	availability of geophysical log
LCAVA(22)	:	cards availability

read on
data card

LTNFI(1000)	:	array of all well numbers
NN	:	index of this well number array

*The number inside the brackets corresponds to the dimensions of the array

```

PROGRAM TES4
  DIMENSION ABMI(3),ABMA(3),ORDMI(3),ORDMA(3),JWEL(2),GELPC(2),EXDET(2),LDATEX(2,2),TYUSPC(36),LAC(2),LDATMC(2),LCAVA(22),RLON(3),RLAT(3),LTN(11),LTNF(1000)
  INTEGER OUT
  IN=6
  OUT=0
  CALL BODERSET(IN,2)
C*** READING OF PARAMETER CARDS ***
  READ(1,10)NFEUI
1000 FORMAT(I2)
  READ(1,106)(TYUSPC(I),I=1,36)
106 FORMAT(36A1)
  READ(IN,130)(LTN(I),I=1,11)
130 FORMAT(11A1)
  DO 2000 IJK=1,NFEUI
    NN=0
    READ(IN,100)CC,NSTAT,LETPC,MANUB,CFTC
100 FORMAT(A2,A1,A1,A4,A2)
    READ(IN,101)(NUWEL(I),I=1,2)
101 FORMAT(2I5)
    READ(IN,102)(ABMI(I),I=1,3),(ABMA(J),J=1,3),(ORDMI(K),K=1,3),(ORDMA(L),L=1,3)
102 FORMAT(4(F3.1,2F2.0))
    READ(IN,103)(GELPC(I),I=1,2)
103 FORMAT(2F5.0)
    READ(IN,104)(EXDET(I),I=1,2)
104 FORMAT(2F5.0)
    READ(IN,105)((LDATEX(I,J),I=1,2),J=1,2)
105 FORMAT(2(I3,I2))
C*** READING OF MASTER CARDS ***
43 READ(IN,107)C4A,NSTMC,LETMC,MNMC,LDEEP,NWMC,(RLON(I),I=1,3),(RLAT(I),I=1,3),LAC(1),GREL,LAC(2),TOTDE,(LDATMC(K),K=1,2),TYUSMC,LGEL,L2GEP,(LCAVA(L),L=1,22)
107 FORMAT(A2,A1,A1,A4,1X,A1,I5,10X,F3.0,5F2.0,A1,F5.0,A1,F5.0,I3,I2,1,A1,2A1,22A1)
C*** HORIZONTAL CORRECTIONS ***
  IF(C4A-CFTC)1,2,1
1 IF(C4A-CC)3,4,3
3 WRITE(OUT,108)NWMC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD *)
4 IF(NSTMC-NSTAT)5,6,5
5 WRITE(OUT,109)NWMC
109 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER *)
6 IF(LETPC-LETMC)7,8,7
7 WRITE(OUT,110)NWMC
110 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER *)
8 IF(MNMC-MANUB)9,10,9
9 WRITE(OUT,111)NWMC
111 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER *)
10 DO 200 I=1,11
  IF(LDEEP-LTN(I))200,11,200
200 CONTINUE
  WRITE(OUT,112)NWMC
112 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEEPENING *)
11 IF(NWMC-JWEL(1))14,13,13
13 IF(NWMC-JWEL(2))15,15,14
14 WRITE(OUT,113)NWMC
113 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER *)
15 ABMI1=ABMI(1)*3600+ABMI(2)*60+ABMI(3)
  ABMA1=ABMA(1)*3600+ABMA(2)*60+ABMA(3)
  ORDMI1=ORDMI(1)*3600+ORDMI(2)*60+ORDMI(3)

```

```

ORDMA=ORDMA(1)*3600+ORDMA(2)*60+ORDMA(3)
RLONG=RLON(1)*3600+RLON(2)*60+RLON(3)
IF(RLONG-ARMIN)16,17,17
17 IF(RLONG-ARMAX)18,18,16
16 WRITE(OUT,111)NWMC
114 FORMAT(2X,*,WELL NUMBER *,15,*, ERROR LONGITUDE *)
18 RLATI=RLAT(1)*3600+RLAT(2)*60+RLAT(3)
IF(RLATI-ORDMIN)19,20,20
20 IF(RLATI-ORDMAX)21,21,19
19 WRITE(OUT,115)NWMC
115 FORMAT(2X,*,WELL NUMBER *,15,*, ERROR LATITUDE *)
21 DO 22 J=1,2
DO 220 K=1,4
IF(LAC(J)-LTN(K))220,22,220
220 CONTINUE
WRITE(OUT,116)NWMC
116 FORMAT(2X,*,WELL NUMBER *,15,*, ERROR CODE ACCURACY *)
22 CONTINUE
IF(GREL-SELPC(1))25,26,26
26 IF(GREL-SELPC(2))27,27,25
25 WRITE(OUT,117)NWMC
117 FORMAT(2X,*,WELL NUMBER *,15,*, ERROR GROUND ELEVATION *)
27 IF(T)IDE=EXDET(1))28,29,29
29 IF(T)IDE=EXDET(2))30,30,28
28 WRITE(OUT,118)NWMC
118 FORMAT(2X,*, WELL NUMBER *,15,*, ERROR TOTAL DEPTH *)
30 LDATE=LDATMC(1)*12+LDATMC(2)
LDMI=LDATMX(1,1)*12+LDATMX(2,1)
LDMA=LDATMX(1,2)*12+LDATMX(2,2)
IF(LDATE-LDMI)31,32,32
32 IF(LDATE-LDMA)33,33,31
31 WRITE(OUT,119)NWMC
119 FORMAT(2X,*, WELL NUMBER *,15,*, ERROR DATE COMPLETED *)
33 DO 34 I=1,36
IF(T)USH=-TYUSPC(I))34,35,34
34 CONTINUE
WRITE(OUT,120)NWMC
120 FORMAT(2X,*, WELL NUMBER *,15,*, ERROR CODE TYPE AND USE *)
35 DO 230 K=1,4
IF(LSEL-LTN(K))230,36,230
230 CONTINUE
WRITE(OUT,121)NWMC
121 FORMAT(2X,*, WELL NUMBER *,15,*, ERROR CODE AVAILABILITY GEOLOGICAL
1 LOGGING *)
36 DO 240 K=1,4
IF(LSEP-LTN(K))240,38,240
240 CONTINUE
WRITE(OUT,122)NWMC
122 FORMAT(2X,*, WELL NUMBER *,15,*, ERROR CODE AVAILABILITY GEOPHYSICAL
1 LOGS *)
38 DO 4) I=1,22
DO 5) J=1,11
IF(LCAVA(I)-LTN(J))50,40,50
50 CONTINUE
WRITE(OUT,123)NWMC
123 FORMAT(2X,*, WELL NUMBER *,15,*, ERROR NUMBER OF CARDS AVAILABLE *)
40 CONTINUE
DO 888 K=3,11
IF(LDEEP-LTN(K))888,999,888
888 CONTINUE
GO TO 999
999 L=K-2
NWMC=L*10000+NWMC

```

Appendix 1

4

```
998 NV=J+1
    LTNF(NV)=NVMC
    GO TO 13
2   NV=NV-1
    IF(N3)473,2000,478
478 DO 410 J=1, JB
    L=J+1
    DO 400 I=L, NV
    IF(LTNF(J)-LTNF(I))450,451,450
451 WRITE(OUT,452)LTNF(J)
452 FORMAT(20,'THEY ARE TWO WELLS WHICH HAVE THE SAME NUMBER',I6)
450 CONTINUE
440 CONTINUE
2000 CONTINUE
    WRITE(OUT,121)
124 FORMAT(10,'END OF THE PROGRAM')
    STOP
    END
```

Appendix 2Program TES4B

IN	:	logical unit number of the card reader	}	read on parameter cards
OUT	:	logical unit number of the printer		
NFEUI	:	number of maps which have to be checked		

TAIN(11)	:	array of integer numbers	}	read on parameter cards
CC	:	card code		
NSTAT	:	State number		
LETPC	:	map letter		
MANUB	:	map number		
CFTC	:	end of card code		
NUWEL(2)	:	well number		

C4B	:	card code	}	read on data cards
NSTDC	:	State number		
LETDC	:	map letter		
MNDC	:	map number		
KS	:	card continuation code		
DEEP	:	deepening		
NWDC	:	well number		
LDIA(4)	:	equipment and drilling diameter		
RNAT	:	nature of equipment		
RMAT	:	material of equipment		
LPRT(4)	:	depth of casing		
RMET(2)	:	method of drilling		
LPRC(2)	:	depth of cementation		
CORRO(2)	:	corrosion		

RAN(2)	:	year completed
TFOR(1000)	:	array of all well numbers
TCS(1000)	:	array of all card continuation code
NN	:	index of both arrays

```

PROGRAM TES43
  DIMENSION NUWEL(2),LDIA(4),RNAT(2),RMT(2),LPRT(4),RMET(2),LPRC(4)
  1,CORRO(2),TAIN(11),RAN(2),TFOR(1000),TCS(1000)
  INTEGER OUT,TFOR,TCS
  IN=6)
  OUT=31
  C*** READING OF PARAMETER CARDS ***
  CALL BODERSET(IN,2)
  READ(IN,1000)NFEUI
  1000 FORMAT(I?)
  READ(IN,102)(TAIN(I),I=1,11)
  102 FORMAT(11A1)
  DO 2100 IJK=1,NFEUI
    NN=0
    READ(IN,100)CC,NSTAT,LETPC,MANUB,CFTC
  100 FORMAT(A2,2A1,A4,A2)
  READ(IN,101)(NUWEL(I),I=1,2)
  101 FORMAT(2I5)
  C*** READING OF DATA CARDS ***
  25 READ(IN,103)C43,NSTDC,LETDC,MNDC,KS,DEEP,NWDC,LDIA(1),RNAT(1),RMT
  1(1),(LPRT(1),I=1,2),LDIA(2),RMET(1),(LPRC(J),J=1,2),CORRO(1),LDIA(
  23),RNAT(2),RMT(2),(LPRT(1),I=3,4),LDIA(4),RMET(2),(LPRC(J),J=3,4)
  3,CORRO(2),(RAN(L),L=1,2)
  103 FORMAT(A2,2A1,A4,I1,A1,I5,I4,2A1,3I4,A1,2I4,A1,2X,I4,2A1,3I4,A1,2I
  14,A1,2X,2A1)
  C*** HORIZONTAL CORRECTIONS ***
  IF(C18-CFTC)1,2,1
  1 IF(C18-C3)3,4,3
  3 WRITE(OUT,104)NWDC
  104 FORMAT(2X,*WELL NUMBER *,15,* ERROR CODE CARD*)
  4 IF(NSTDC-NSTAT)5,6,5
  5 WRITE(OUT,105)NWDC
  105 FORMAT(2X,*WELL NUMBER *,15,* ERROR STATE NUMBER*)
  6 IF(LETDC-LETRC)7,8,7
  7 WRITE(OUT,106)NWDC
  106 FORMAT(2X,*WELL NUMBER *,15,* ERROR MAP LETTER*)
  8 IF(MNDC-MANUB)9,11,9
  9 WRITE(OUT,107)NWDC
  107 FORMAT(2X,*WELL NUMBER *,15,* ERROR MAP NUMBER*)
  11 DO 1) I=1,11
    IF(DEEP-TAIN(I))10,12,10
  10 CONTINUE
  WRITE(OUT,103)NWDC
  108 FORMAT(2X,*WELL NUMBER *,15,* ERROR DEEPENING*)
  12 IF(NWDC-NUWEL(1))13,14,14
  14 IF(NWDC-NUWEL(2))15,15,13
  13 WRITE(OUT,153)NWDC
  158 FORMAT(2X,*WELL NUMBER *,15,* ERROR WELL NUMBER*)
  15 DO 2) I=1,4
  20 LDIA(I)=LDIA(I)/100
  DO 3) I=1,4,2
    IF(LDIA(I)-LDIA(I+1))30,30,16
  30 CONTINUE
  GO TO 17
  16 IF(LDIA(I+1))18,17,18
  18 WRITE(OUT,109)NWDC
  109 FORMAT(2X,*WELL NUMBER *,15,* ERROR DIAMETER DRILLING OR CASING*)
  17 DO 4) I=1,2
  DO 5) J=1,11
    IF(RJAT(I)-TAIN(J))50,40,50
  50 CONTINUE
  WRITE(OUT,11)NWDC

```

```

210 FORMAT(2X, *WELL NUMBER *, I5, * ERROR CODE NATURE EQUIPEMENT*)
90 CONTINUE
DO 60 I=1,2
DO 70 J=1,11
IF(RIAT(I)-TAIN(J))70,60,70
70 CONTINUE
WRITE(OUT,111)NWDC
111 FORMAT(2X, *WELL NUMBER *, I5, * ERROR CODE MATERIAL EQUIPEMENT*)
60 CONTINUE
DO 80 I=1,4,2
IF(LPRT(I)-LPRT(I+1))80,87,87
87 IF(LPRT(I))83,80,88
88 WRITE(OUT,112)NWDC
112 FORMAT(2X, *WELL NUMBER *, I5, * ERROR DEPTH CASING*)
80 CONTINUE
DO 90 I=1,2
DO 200 J=1,11
IF(RIET(I)-TAIN(J))200,90,200
200 CONTINUE
WRITE(OUT,113)NWDC
113 FORMAT(2X, *WELL NUMBER *, I5, * ERROR CODE METHOD OF DRILLING*)
90 CONTINUE
DO 210 K=1,4,2
IF(LPRC(K)-LPRC(K+1))210,19,19
19 IF(LPRC(K))21,210,21
21 WRITE(OUT,114)NWDC
114 FORMAT(2X, *WELL NUMBER *, I5, * ERROR DEPTH OF CEMENTING*)
210 CONTINUE
DO 220 I=1,2
DO 230 K=1,4
IF(CORRO(I)-TAIN(K))230,220,230
230 CONTINUE
WRITE(OUT,115)NWDC
115 FORMAT(2X, *WELL NUMBER *, I5, * ERROR CODE CORROSION*)
220 CONTINUE
DO 250 I=1,2
DO 270 J=1,11
IF(RAN(I)-TAIN(J))270,250,270
270 CONTINUE
WRITE(OUT,116)NWDC
116 FORMAT(2X, *WELL NUMBER *, I5, * ERROR YEAR COMPLETED*)
250 CONTINUE
DO 888 K=3,11
IF(DEEP-TAIN(K))888,999,888
888 CONTINUE
GO TO 999
999 NWDC=(K-2)*100000+NWDC
998 NV=NV+1
TFOR(NV)=NWDC
TCS(NV)=KS
GO TO 25
2 CALL VEC(SQ(TFOR,TCS,NV))
2000 CONTINUE
WRITE(OUT,117)
117 FORMAT(2X, *END OF THE PROGRAM TES48*)
STOP
END

```

```
SUBROUTINE VECOSU(TFOR,ICS,NB)
  DIMENSION TFOR(1),TCS(1)
  INTEGER IFOR,ICS
  DO 10 I=1,NB
    IF(TCS(I))1,2,1
1  IF(I-NB)3,4,5
4  PRINT 10),TFOR(I)
100 FORMAT(2X,*WELL NUMBER *,I6,* ERROR CODE COL,9*)
    GO TO 4
3  IF(TFOR(I)-TFOR(I+1))5,10,5
5  PRINT 10),TFOR(I)
    GO TO 10
2  IF(I-NB)6,8,6
6  IF(TFOR(I)-TFOR(I+1))10,7,10
7  PRINT 10),TFOR(I)
10 CONTINUE
8  RETURN
END
```

Appendix 3Program TES4C

IN	:	logical unit number of the card reader
OUT	:	logical unit number of the printer
NFEUI	:	number of maps which have to be checked

TAIN(11)	:	array of integer numbers
TALET(27)	:	array of letters
CC	:	card code
NSTAT	:	State number
LETPC	:	map letter
MANUB	:	map number
CFTC	:	end of cards code
NUWEL(2)	:	well number

read on
parameter cards

C4C	:	card code
NSTDC	:	State number
LETDC	:	map letter
MNDC	:	map number
KS	:	card continuation code
DEEP	:	deepening
NWDC	:	well number
DEPTH (7)	:	depth of each formation
RITP(7)	:	first letter of the lithostratigraphy
RITD(3, 7)	:	stratigraphical code

read on
data cards

TFOR(1000)	:	array of all well numbers
TCS(1000)	:	array of all card continuation code
NN	:	index of both arrays

```

PROGRAM TES43
  DIMENSION NUWEL(2),TAIN(11),TALET(27),DEPTH(7),RITP(7),RITD(3,7),
  1TCS(1000),TFOR(1000)
  INTEGER OUT,TCS,TFOR
  IN=6)
  OUT=51
  CALL BODERSET(IN,2)
C *** READING OF PARAMETER CARDS ***
  READ(IN,1000)NFEUI
1000 FORMAT(I2)
  READ(IN,102)(TAIN(I),I=1,11)
102 FORMAT(11A1)
  READ(IN,103)(TALET(J),J=1,27)
103 FORMAT(27A1)
  DO 2000 IJK=1,NFEUI
    NN=0
    READ(IN,100)CC,NSTAT,LETDC,MANUB,CFTC
100 FORMAT(A2,2A1,A4,A2)
    READ(IN,101)(NUWEL(I),I=1,2)
101 FORMAT(2I5)
C *** READING OF DATA CARDS ***
71 READ(IN,104)C4C,NSTDC,LETDC,MNDC,KS,DEEP,NWDC,(DEPTH(I),RITP(I),(R
1ITD(J,I),J=1,3),I=1,7)
104 FORMAT(A2,2A1,A4,I1,A1,I5,7(F5.0,A1,3A1))
C *** HORIZONTAL CORRECTIONS ***
  IF(C4C-CFTC)1,2,1
1 IF(C4C-C2)3,4,3
3 WRITE(OUT,105)NWDC
105 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
4 IF(NSTDC-NSTAT)5,6,5
5 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
6 IF(LETDC-LETPC)7,8,7
7 WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
8 IF(MNDC-MANUB)9,11,9
9 WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
11 DO 1) I=1,11
  IF(TAIN(I)-DEEP)10,12,10
10 CONTINUE
  WRITE(OUT,109)NWDC
109 FORMAT(2X,*WELL NUMBER *,I5,*ERROR DEEPENING*)
12 IF(NWDC-JUWEL(1))13,14,14
14 IF(NWDC-JUWEL(2))15,15,13
13 WRITE(OUT,110)NWDC
110 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
15 DO 2) I=1,6
  IF(DEPTH(I+1)-DEPTH(I))21,21,20
21 IF(DEPTH(I+1))22,20,22
22 WRITE(OUT,111)NWDC
111 FORMAT(2X,*WELL NUMBER *,I5,* ERROR IN DEPTH OF THE BEDS*)
20 CONTINUE
  DO 3) I=1,7
  DO 4) J=1,11
  IF(RITP(I)-TALET(J))40,30,40
40 CONTINUE
  WRITE(OUT,112)NWDC
112 FORMAT(2X,*WELL NUMBER *,I5,* ERROR IN THE FIRST LETTER OF THE GEO
1L, MAP CODE*)
30 CONTINUE
  DO 5) K=1,7

```

```
DO 6 J=1,3
DO 7 L=1,27
IF(RIT)(J,K)-TALET(L))70,60,70
70 CONTINUE
WRITE(OUT,113)NWDC
113 FORMAT(2X,*WELL NUMBER *,15,* ERROR GEOL.MAP CODE*)
60 CONTINUE
50 CONTINUE
DO 8 K=3,11
IF(DEEP-TAIN(K))688,999,888
888 CONTINUE
GO TO 993
999 NWDC=(K-2)*100000+NWDC
998 IN=NN+1
TFOR(NN)=NWDC
TCS(IN)=KS
30 TO 71
2 CALL VECDSU(TFOR,TCS,NN)
2000 CONTINUE
WRITE(OUT,114)
114 FORMAT(2X,*END OF THE PROGRAM TES4C*)
STOP
END
```

Appendix 4Program TES4D

IN	: logical unit number of the card reader
OUT	: logical unit number of the printer
NFEUI	: number of maps which have to be checked

TAIN(11)	: array of integers
TALET(27)	: array of letters
SIGD(2)	: signs
BLANC	: blank
CC	: card code
NSTAT	: State number
LETPC	: map letter
MANUB	: map number
CFTC	: end of cards code

read on
parameter cards

C4D	: card code
NSTMC	: State number
LEPMC	: map letter
MNMC	: map number
KS	: card continuation
DEEP	: deepening
NWMC	: well number
AQNU(6)	: aquifer number
TOP(2)	: depth of the top of the water producing interval
BOT(2)	: depth of the bottom of the water producing interval
STR(8)	: lithostratigraphy
CLS(2)	: permeability class
SCE(2)	: source of permeability determination
REL(2)	: reliability of information about permeability
DEPT(2)	: depth method
SIGN(2)	: sign
PD(8)	: pressure or depth of the water level
TFOR(1000)	: array of all well numbers
TCS(1000)	: array of all card continuation code
NN	: index of both arrays

read on
data cards

```

PROGRAM TES49
DIMENSION NUWEL(2),TAIN(11),TALET(27),AQNU(6),STR(9),TOP(2),BOT(2)
1,CLS(2),SCE(2),REL(2),DEPT(2),SIGN(2),FLOW(2),PAR(4),TCS(1000),
2TFOR(1000),PD(8),SIGD(3)
INTEGER OUT,TFOR,TCS,FLOW
IN=6)
OUT=31
CALL BCDERSET(IN,2)
C *** READING OF PARAMETER CARDS ***
READ(IN,1010)NFEUI
1000 FORMAT(I2)
READ(IN,102)(TAIN(I),I=1,11)
102 FORMAT(11A1)
READ(IN,103)(TALET(I),I=1,27)
103 FORMAT(27A1)
READ(IN,104)(SIGD(I),I=1,3),BLANC
104 FORMAT(3A1,A5)
DO 2000 IJK=1,NFEUI
NN=0
READ(IN,100)CC,NSTAT,LETPC,MANUB,CFTC
100 FORMAT(A2,2A1,A4,A2)
READ(IN,101)(NUWEL(I),I=1,2)
101 FORMAT(2I5)
C *** READING OF DATA CARDS ***
26 READ(IN,105)C4D,NSTMC,LETMC,MNMC,KS,DEEP,NWMC,(AQNU(I),I=1,3),TOP(
11),BOT(1),(STR(J),J=1,4),CLS(1),SCE(1),REL(1),DEPT(1),SIGN(1),(PD(
2I),I=1,4),FLOW(1),(AQNU(I),I=4,6),TOP(2),BOT(2),(STR(J),J=5,8),CLS
3(2),SCE(2),REL(2),DEPT(2),SIGN(2),(PD(I),I=5,8),FLOW(2)
105 FORMAT(A2,2A1,A4,I1,A1,I5,3A1,2F4,0,7A1,F4,0,A1,4A1,I5,3A1,2F4,0,
17A1,F4,0,A1,1A1,I5)
IF(C4D-CFTC)1,2,1
1 IF(C4D-CO)3,4,3
3 WRITE(OUT,106)NWMC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CAR)*)
4 IF(NSTMC-NSTAT)5,6,5
5 WRITE(OUT,107)NWMC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
6 IF(LETPC-LETMC)7,8,7
7 WRITE(OUT,108)NWMC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
8 IF(MNMC-MANUB)9,11,9
9 WRITE(OUT,109)NWMC
109 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
11 DO 1) I=1,11
IF(DEEP-TAIN(I))10,62,10
10 CONTINUE
WRITE(OUT,111)NWMC
110 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEEPENING*)
62 IF(NWMC-NUWEL(1))12,13,13
13 IF(NWMC-NUWEL(2))14,14,12
12 WRITE(OUT,111)NWMC
111 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER *)
14 PAR(1)=TOP(1)
PAR(2)=BOT(1)
PAR(3)=TOP(2)
PAR(4)=BOT(2)
DO 4) I=1,3
IF(PAR(I)-PAR(I+1))40,40,15
15 IF(PAR(I+1))17,16,17
40 CONTINUE
GO TO 16
17 WRITE(OUT,113)NWMC

```

```

113 FORMAT(2X, *WELL NUMBER *, I5, * ERROR DEPTH OF THE AQUIFER BEDS*)
16 DO 5) L=1,2
   1=L*2-1
   IF(DEPT(L)-PAR(M))18,19,19
18 IF(PAR(M))21,19,21
19 IF(DEPT(L)-PAR(M+1))5) ,50,52
52 IF(PAR(M+1))21,50,21
50 CONTINUE
   GO TO 22
21 WRITE(OUT,114)NWMC
114 FORMAT(2X, *WELL NUMBER *, I5, * ERROR DEPTH TESTED*)
22 DO 6) I=1,8
   DO 7) K=1,27
   IF(STR(I)-TALET(K))70,60,70
70 CONTINUE
   WRITE(OUT,115)NWMC
115 FORMAT(2X, *WELL NUMBER *, I5, * ERROR LITHO STRATIGRAPHIE*)
60 CONTINUE
   DO 8) J=1,2
   DO 9) K=1,5
   IF(CLS(J)-TAIN(K))90,80,90
90 CONTINUE
   WRITE(OUT,116)NWMC
116 FORMAT(2X, *WELL NUMBER *, I5, * ERROR PERMEABILITY CLASS*)
80 CONTINUE
   DO 20) I=1,2
   DO 210 K=1,5
   IF(SCE(I)-TAIN(K))210,200,210
210 CONTINUE
   WRITE(OUT,117)NWMC
117 FORMAT(2X, *WELL NUMBER *, I5, * ERROR SOURCE PERMEABILITY DETERMINAT
118ION*)
200 CONTINUE
   DO 220 L=1,2
   DO 230 M=1,4
   IF(REL(L)-TAIN(M))230,220,230
230 CONTINUE
   WRITE(OUT,118)NWMC
118 FORMAT(2X, *WELL NUMBER *, I5, * ERROR PERMEABILITY RELIABILITY*)
220 CONTINUE
   DO 310 I=1,8
   DO 320 J=1,11
   IF(PD(I)-TAIN(J))320,310,320
320 CONTINUE
   WRITE(OUT,311)NWMC
311 FORMAT(2X, *WELL NUMBER *, I5, * ERROR PRESSURE DEPTH*)
310 CONTINUE
   DO 240 K=1,2
   DO 250 J=1,3
   IF(SIGN(K)-SIGD(J))250,240,250
250 CONTINUE
   WRITE(OUT,119)NWMC
119 FORMAT(2X, *WELL NUMBER *, I5, * ERROR SIGN PRESSURE DEPTH*)
240 CONTINUE
25 DO 800 K=3,11
   IF(DEEP-TAIN(K))800,801,800
800 CONTINUE
   GO TO 802
801 NWMC=(K-2)*100000+NWMC
802 NN=NN+1
   TFOR(NN)=NWMC
   TCS(NN)=KS
   GO TO 26

```

```
2 CALL VECOSU(TFOR,TCS,NN)
2000 CONTINUE
      WRITE(OUT,120)
120 FORMAT(2X,*END OF THE PROGRAM TES4D*)
      STOP
      END
```

Appendix 5Program TES4E

IN	: logical unit numbers of the card reader	}	read on parameter card
OUT	: logical unit number of the printer		
NFEUI	: number of maps which have to be checked		
TAIN(11)	: array of integer numbers	}	read on parameter card
SIGN(3)	: signs		
TYFLOW(6)	: type of flow		
CC	: card code		
NSTAT	: State number		
LETPC	: map letter		
MANUB	: map number		
CFTC	: end of cards code		
NUWEL(2)	: well number		
C4E	: card code	}	read on data cards
NSDC	: State number		
LETPC	: map letter		
MNDC	: map number		
KS	: card continuation code		
DEEP	: deepening		
NWDC	: well number		
AQUI	: aquifer number		
RELI	: reliability about the tapped aquifer		
SINWL	: single well		
IAN(3)	: year of discharge measurement		
MOIS(3)	: month of discharge measurement		
DISC(12)	: discharge rate		
RELD(3)	: reliability about the well discharge rate		
SIGD(3)	: sign for the dynamic level or back pressure		
DYLE(12)	: dynamic level		
UNIT(3)	: unit in which the dynamic level is expressed		
TYFL(3)	: type of flow		
OUTLET(3)	: outlet of the well		
TFOR(1000)	: array of all well number		
TCS(1000)	: array of all card continuation code		
NN:	: index of both arrays		

```

PROGRAM TES4E(INPUT,OUTPUT,TAPE60=INPUT,TAPE61=OUTPUT)
DIMENSION NUWEL(2),TAIN(11),SIGN(3),TYFLW(6),IAN(3),MOIS(3),DISC(1
12),RELD(3),SIGD(3),DYLE(12),UNIT(3),TYFLO(3),OUTLET(3),LTIME(3),
2TFOR(100),TCS(1000)
INTEGER OUT,TFOR,ICS
DATA(ECH=1HH)
IN=6J
OUT=61
C *** READING OF PARAMETER CARDS ***
READ(IN,1000)NFEUI
1000 FORMAT(I2)
READ(IN,222)(TAIN(I),I=1,11)
222 FORMAT(11A1)
READ(IN,333)(SIGN(J),J=1,3)
333 FORMAT(3A1)
READ(IN,444)(TYFLW(I),I=1,6)
444 FORMAT(6A2)
DO 2000 IJK=1,NFEUI
NN=0
READ(IN,100)CC,NSTAT,LETDC,MANUB,OFDC
100 FORMAT(A2,2A1,A4,A2)
READ(IN,101)(NUWEL(I),I=1,2)
101 FORMAT(2I5)
C *** READING OF DATA CARDS ***
301 READ(IN,102)O4E,NSDC,LETDC,MNDC,KS,DEEP,NWDC,AQU,RELI,SINWL,IAN(1
1),MOIS(1),(DISC(I),I=1,4),RELD(1),SIGD(1),(DYLE(J),J=1,4),UNIT(1),
2TYFL(1),OUTLET(1),IAN(2),MOIS(2),(DISC(I),I=5,8),RELD(2),SIGD(2),
3(DYLE(J),J=5,8),UNIT(2),TYFLO(2),OUTLET(2),IAN(3),MOIS(3),(DISC(I)
4,I=9,12),RELD(3),SIGD(3),(DYLE(J),J=9,12),UNIT(3),TYFLO(3),OUTLET(
53)
102 FORMAT(A2,2A1,A4,I1,A1,I5,3A1,3(2I2,11A1,A2,A1,2X))
C *** HORIZONTAL CORRECTIONS ***
IF(C4E-CC)1,2,1
1 IF(C4E-CC)3,4,3
3 WRITE(OUT,103)NWDC
103 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
4 IF(NSDC-NSTAT)5,6,5
5 WRITE(OUT,104)NWDC
104 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
6 IF(LETDC-LETDC)7,8,7
7 WRITE(OUT,105)NWDC
105 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
8 IF(MNDC-MANUB)9,11,9
9 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
11 DO 10 I=1,11
IF(DEEP-TAIN(I))10,12,10
10 CONTINUE
WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEEPENING*)
12 IF(NWDC-NUWEL(1))13,14,14
14 IF(NWDC-NUWEL(2))15,15,13
13 WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
15 DO 20 J=1,4
IF(SINWL-TAIN(J))20,16,20
20 CONTINUE
WRITE(OUT,109)NWDC
109 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE SINGLE WELL*)
16 DO 40 L=1,5
IF(RELI-TAIN(L))40,18,40
40 CONTINUE

```

```

WRITE(OUT,111)NWDC
111 FORMAT(2X,*WELL NUMBER *,15,* ERROR CODE AQUIFER RELIABILITY*)
18 DO 50 J=1,3
  IF(IAN(J)-85)19,19,21
19 LTIME(J)=(900+IAN(J))*12+MOIS(J)
  GO TO 50
21 LTIME(J)=(800+IAN(J))*12+MOIS(J)
50 CONTINUE
  DO 60 I=1,2
    IF(LTIME(I)-LTIME(I+1))60,60,22
22 IF(MOIS(I+1))23,24,23
23 WRITE(OUT,112)NWDC
112 FORMAT(2X,*WELL NUMBER *,15,*ERROR DATE OF MEASUREMENT*)
60 CONTINUE
24 DO 70 I=1,12
  DO 80 J=1,11
    IF(DISC(I)-TAIN(J))80,70,80
80 CONTINUE
  WRITE(OUT,113)NWDC
113 FORMAT(2X,*WELL NUMBER *,15,* ERROR DISCHARGE RATE*)
70 CONTINUE
  DO 90 I=1,3
    DO 200 J=1,5
      IF(RELD(I)-TAIN(J))200,90,200
200 CONTINUE
  WRITE(OUT,114)NWDC
114 FORMAT(2X,*WELL NUMBER *,15,* ERROR DISCHARGE RELIABILITY*)
90 CONTINUE
  DO 210 I=1,3
    DO 220 J=1,3
      IF(SIGD(I)-SIGN(J))220,210,220
220 CONTINUE
  WRITE(OUT,115)NWDC
115 FORMAT(2X,*WELL NUMBER *,15,* ERROR DYNAMIC LEV. SIGN*)
210 CONTINUE
  DO 230 I=1,12
    DO 240 J=1,11
      IF(DYLE(I)-TAIN(J))240,230,240
240 CONTINUE
  WRITE(OUT,116)NWDC
116 FORMAT(2X,*WELL NUMBER *,15,* ERROR DYNAMIC LEV. MEASUREMENT*)
230 CONTINUE
  DO 250 K=1,3
    DO 260 L=1,5
      IF(UNIT(K)-TAIN(L))260,250,260
260 CONTINUE
  WRITE(OUT,117)NWDC
117 FORMAT(2X,*WELL NUMBER *,15,* ERROR CODE UNIT OF DYNAMIC LEV. MEAS
  UREMENT*)
250 CONTINUE
  DO 270 I=1,3
    DO 280 J=1,6
      IF(TYFLO(I)-TYFLW(J))280,270,280
280 CONTINUE
  WRITE(OUT,118)NWDC
118 FORMAT(2X,*WELL NUMBER *,15,* ERROR TYPE OF FLOW*)
270 CONTINUE
  DO 290 I=1,3
    DO 300 J=1,11
      IF(OUTLET(I)-TAIN(J))300,290,300
300 CONTINUE
  IF(OUTLET(I)-ECH)302,290,302
302 WRITE(OUT,119)NWDC

```

Appendix 5

4

```
119 FORMAT(2X,*WELL NUMBER *,I5,*ERROR CODE OUTLET*)
290 CONTINUE
    DO 888 K=3,11
    IF(DEEP-TAIN(K))888,999,888
888 CONTINUE
    GO TO 993
999 NWDC=(K-2)*100000+NWDC
998 NN=NN+1
    TFOR(NN)=NWDC
    TCS(NN)=KS
    GO TO 301
    2 CALL VECOSU(TFOR,TCS,NN)
2000 CONTINUE
    WRITE(OUT,12))
120 FORMAT(2X,*END OF THE PROGRAM TES4E*)
    STOP
    END
```

Appendix 6

Program TESAF

IN : logical unit number of the card reader
OUT : logical unit number of the printer
NFEUI : number of maps which have to be checked

TAIN(11) : array of integer numbers
TYFLW(6) : type of flow
CC : card code
NSTAT : State number
LETTPC : map letter
MANUB : map number
CFPC : end of cards code
NUWEL : well number

read on
parameter cards

C4F : card code
NSDC : State number
LETDC : map letter
MNDC : map number
KS : card continuation code
DEEP : deepening
NWDC : well number
AQUI : aquifer number
RELI : reliability about the tapped aquifer
IAN(3) : year of production
DISC(12) : discharge rate
PRPE(21) : production period
REPR : reliability of the production period
TYYP(12) : total yearly production
TYFLO(3) : type of flow

read on data
cards

TFOR(1000) : array of all well numbers
TCS(1000) : array of all card continuation code
NN : index of both arrays

```

PROGRAM TES4F
DIMENSION TAIN(11),TYFLW(6),NUWEL(2),DISC(12),IAN(3),PRPE(21),REPR
1(3),TOYP(12),TYFLO(3),TFOR(100),TCS(100)
INTEGER OUT,TFOR,TCS
IN=6)
OUT=31
CALL BODERSET(IN,2)
C *** READING OF PARAMETER CARDS ***
READ(IN,1000)NFEUI
1000 FORMAT(12)
READ(IN,444)(TAIN(I),I=1,11)
444 FORMAT(11A1)
READ(IN,333)(TYFLW(I),I=1,6)
333 FORMAT(6A2)
DO 2000 IJK=1,NFEUI
NN=0
READ(IN,100) CC,NSTAT,LETPC,MANUB,CFTC
100 FORMAT(A2,2A1,A4,A2)
READ(IN,101)(NUWEL(I),I=1,2)
101 FORMAT(2I5)
C *** READING OF DATA CARDS ***
840 READ(IN,102)CAF,NSDC,LETDC,MNDC,KS,DEEP,NWDC,AQUI,RELI,IAN(1),(DIS
10(I),I=1,4),(PRPE(J),J=1,7),REPR(1),(TOYP(K),K=1,4),TYFLO(1),IAN(2
2),(DISC(I),I=5,8),(PRPE(J),J=8,14),REPR(2),(TOYP(K),K=5,8),TYFLO(2
3),IAN(3),(DISC(I),I=9,12),(PRPE(J),J=15,21),REPR(3),(TOYP(K),K=9,1
42),TYFLO(3)
102 FORMAT(A2,2A1,A4,I1,A1,I5,2A1,3(I2,16A1,A2))
C *** HORIZONTAL CORRECTIONS ***
DO 83 I=1,3
IF(IAN(I)-72)87,87,89
87 IAN(I)=IAN(I)+900
GO TO 88
89 IAN(I)=IAN(I)+300
88 CONTINUE
IF(CIF-CFTC)1,2,1
1 IF(CIF-CC)3,1,3
3 WRITE(OUT,103)NWDC
103 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
4 IF(NSDC-NSTAT)5,6,5
5 WRITE(OUT,104)NWDC
104 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
6 IF(LETDC-LETPC)7,8,7
7 WRITE(OUT,105)NWDC
105 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
8 IF(MNDC-MANUB)9,11,9
9 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
11 DO 10 I=1,11
IF(DEEP-TAIN(I))10,12,10
10 CONTINUE
WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEEPENING*)
12 IF(NWDC-NUWEL(1))13,14,14
14 IF(NWDC-NUWEL(2))15,15,13
13 WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
15 DO 30 K=1,5
IF(RELI-TAIN(K))30,17,30
30 CONTINUE
WRITE(OUT,110)NWDC
110 FORMAT(2X,*WELL NUMBER *,I5,* ERROR AQUIFER RELIABILITY*)
17 DO 40 I=1,2

```

```

      IF(IAN(I)-IAN(I+1))40,18,18
18  IF(TYFLO(I+1)-TYFLW(6))19,40,19
40  CONTINUE
      GO TO 21
19  WRITE(OUT,111)NWDC
111  FORMAT(2X,*WELL NUMBER *,15,* ERROR YEAR OF PRODUCTION*)
21  DO 50 J=1,12
      DO 60 K=1,11
      IF(DISC(J)-TAIN(K))60,50,60
60  CONTINUE
      WRITE(OUT,112)NWDC
112  FORMAT(2X,*WELL NUMBER *,15,* ERROR DISCHARGE RATE*)
50  CONTINUE
      DO 70 L=1,21
      DO 80 M=1,11
      IF(PRPE(L)-TAIN(M))80,70,80
80  CONTINUE
      WRITE(OUT,113)NWDC
113  FORMAT(2X,*WELL NUMBER *,15,* ERROR PRODUCTION PERIOD*)
70  CONTINUE
      DO 90 I=1,3
      DO 200 J=1,5
      IF(REPR(I)-TAIN(J))200,90,200
200  CONTINUE
      WRITE(OUT,311)NWDC
311  FORMAT(2X,*WELL NUMBER *,15,*ERROR PRODUCTION RELIABILITY*)
90  CONTINUE
      DO 210 K=1,12
      DO 220 L=1,11
      IF(TYP(K)-TAIN(L))220,210,220
220  CONTINUE
      WRITE(OUT,312)NWDC
312  FORMAT(2X,*WELL NUMBER *,15,* ERROR TOTAL YEARLY PROD.*)
210  CONTINUE
      DO 230 M=1,3
      DO 240 N=1,6
      IF(TYFLO(M)-TYFLW(N))240,230,240
240  CONTINUE
      WRITE(OUT,313)NWDC
313  FORMAT(2X,*WELL NUMBER *,15,* ERROR TYPE OF FLOW*)
230  CONTINUE
      DO 888 K=3,11
      IF(DEEP-TAIN(K))888,999,888
888  CONTINUE
      GO TO 998
999  NWDC=(K-2)*100000+NWDC
998  NN=NV+1
      TFOR(NN)=NWDC
      TCS(NN)=KS
      GO TO 840
2  CALL VECJSU(TFOR,TCS,NN)
2000  CONTINUE
      WRITE(OUT,114)
114  FORMAT(2X,* END OF THE PROGRAM TES4F*)
      STOP
      END

```

Appendix 7

Program TES4G

IN : logical unit number of the card reader
OUT : logical unit number of the printer
NFEUI : number of maps which have to be checked

TAIN(11) : array of integer numbers
CC : card code
NSTAT : State number
LETPC : map letter
MANUB : map number
CFPC : end of cards code
NUWEL(2) : well number

read on
parameter card

C4G : card code
NSDC : State number
LETDC : map letter
MNDC : map number
KS : card continuation code
DEEP : deepening
NWDC : well number
AQUI : aquifer number
RELI : reliability of aquifer number
IAN(3), MOIS(3) : year and month of measurement
BIDUP(3) : build up
SIGD(3) : sign of the pressure or depth
PRDE(15) : pressure, depth, or elevation of the water
COUN : unit in which the pressure, depth, or
elevation is expressed

read on
data cards

TEMPN(18) : temperature
CTE(3) : unit in which the temperature is expressed
RETEM(3) : reliability of temperature measurement
LTIME(3) : time expressed in month

TFWR(1000) : array of all well numbers
TCS(1000) : array of all card continuation code
NN : index of both arrays

```

PROGRAM TES4G
DIMENSION NUWEL(2),TAIN(11),SIGN(3),IAN(3),MOIS(3),BIDUP(3),SIGD(3),
PRDE(15),COUN(3),TEMPN(18),CTE(3),RETEM(3),LTIME(3),TFOR(1000),
2TCS(1000)
INTEGER OUT,TFOR,ICS
IN=61
OUT=31
CALL BCDERSET(IN,2)
C *** READING OF PARAMETER CARDS ***
READ(IN,1000)NFEUI
1000 FORMAT(I2)
READ(IN,102)(TAIN(J),J=1,11)
102 FORMAT(11A1)
READ(IN,103)(SIGN(I),I=1,3)
103 FORMAT(3A1)
DO 2100 IJK=1,NFEUI
  IN=0
  READ(IN,100)CC,NSTAT,LETPC,MANUB,CFTC
  100 FORMAT(A2,2A1,A4,A2)
  READ(IN,101)(NUWEL(I),I=1,2)
  101 FORMAT(2I5)
C *** READING OF DATA CARDS ***
300 READ(IN,104)C4G,NSDC,LETRC,MNDC,KS,DEEP,NWDC,AQUI,RELI,IAN(1),MOIS
1(1),BIDUP(1),SIGD(1),(PRDE(I),I=1,5),COUN(1),(TEMPN(J),J=1,6),CTE
2(1),RETEM(1),IAN(2),MOIS(2),BIDUP(2),SIGD(2),(PRDE(I),I=6,10),COUN
3(2),(TEMPN(J),J=7,12),CTE(2),RETEM(2),IAN(3),MOIS(3),BIDUP(3),SIGD
4(3),(PRDE(I),I=11,15),COUN(3),(TEMPN(J),J=13,18),CTE(3),RETEM(3)
104 FORMAT(A2,2A1,A4,I1,A1,I5,2A1,3(2I2,16A1))
C *** HORIZONTAL CORRECTIONS ***
IF(C4G-CFTC)1,2,1
1 IF(C4G-CC)3,4,3
3 WRITE(OUT,105)NWDC
105 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
4 IF(NSDC-NSTAT)5,6,5
5 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
6 IF(LETRC-LETRC)7,8,7
7 WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
8 IF(MNDC-MANUB)9,11,9
9 WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
11 DO 11 I=1,11
  IF(DEEP-TAIN(I))10,12,10
10 CONTINUE
  WRITE(OUT,109)NWDC
109 FORMAT(2X,*WELL NUMBER *,I5,*ERROR DEEPENING*)
12 IF(NWDC-NUWEL(1))13,14,14
14 IF(NWDC-NUWEL(2))15,15,13
13 WRITE(OUT,110)NWDC
110 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
15 DO 31 K=1,5
  IF(RELI-TAIN(K))30,17,30
30 CONTINUE
  WRITE(OUT,112)NWDC
112 FORMAT(2X,*WELL NUMBER *,I5,* ERROR AQUIFER RELIABILITY*)
17 DO 41 J=1,3
  IF(IAN(J)-70)18,18,19
18 LTIME(J)=(700+IAN(J))*12+MOIS(J)
  GO TO 40
19 LTIME(J)=(800+IAN(J))*12+MOIS(J)
40 CONTINUE

```

```

      DO 5) I=1,2
      IF(LTIME(I)-LTIME(I+1))50,21,21
21  IF(M)IS(I+1)722,23,22
22  WRITE(OUT,113)NWDC
113  FORMAT(2X,* WELL NUMBER *,15,* ERROR DATE OF MEASUREMENT*)
50  CONTINUE
23  DO 6) I=1,3
      DO 7) K=1,4
      IF(BIDUP(I)-TAIN(K))70,60,70
70  CONTINUE
      WRITE(OUT,114)NWDC
114  FORMAT(2X,*WELL NUMBER *,15,* ERROR CODE BUILD UP*)
60  CONTINUE
      DO 8) I=1,3
      DO 9) J=1,3
      IF(SIG(I)-SIGN(J))90,80,90
90  CONTINUE
      WRITE(OUT,115)NWDC
115  FORMAT(2X,*WELL NUMBER *,15,* ERROR SIGN PRESSURE OR DEPTH ELEVATI
10N*)
80  CONTINUE
      DO 200 I=1,15
      DO 210 J=1,11
      IF(PRDE(I)-TAIN(J))210,200,210
210  CONTINUE
      WRITE(OUT,116)NWDC
116  FORMAT(2X,*WELL NUMBER *,15,* ERROR PRESSURE OR DEPTH ELEVATION*)
200  CONTINUE
      DO 220 L=1,3
      DO 230 M=1,5
      IF(COUN(L)-TAIN(M))230,220,230
230  CONTINUE
      WRITE(OUT,117)NWDC
117  FORMAT(2X,*WELL NUMBER *,15,* ERROR UNIT OF PRESSURE OR DEPTH ELEV
1ATION*)
220  CONTINUE
      DO 240 I=1,13
      DO 250 J=1,11
      IF(TEMPN(I)-TAIN(J))250,240,250
250  CONTINUE
      WRITE(OUT,118)NWDC
118  FORMAT(2X,*WELL NUMBER *,15,* ERROR TEMPERATURE OR REFERENCE LEVEL
1*)
240  CONTINUE
      DO 260 I=1,3
      DO 270 J=1,4
      IF(CTE(I)-TAIN(J))270,260,270
270  CONTINUE
      WRITE(OUT,119)NWDC
119  FORMAT(2X,*WELL NUMBER *,15,* ERROR TEMPERATURE SYSTEM*)
260  CONTINUE
      DO 280 M=1,3
      DO 290 N=1,5
      IF(RETEM(M)-TAIN(N))290,280,290
290  CONTINUE
      WRITE(OUT,120)NWDC
120  FORMAT(2X,*WELL NUMBER *,15,* ERROR MEASUREMENT RELIABILITY*)
280  CONTINUE
      DO 888 K=3,11
      IF(DEEP-TAIN(K))888,999,888
888  CONTINUE
      GO TO 999
999  NWDC=(K-2)*100000+NWDC

```

```
998 NN=NN+1
    TFOR(NN)=NWDC
    TCS(NN)=KS
    GO TO 301
2 CALL VECDSU(TFOR,TCS,NN)
2000 CONTINUE
    WRITE(OUT,121)
121 FORMAT(2X,'END OF THE PROGRAM TES4G*')
    STOP
    END
```

Appendix 8Program TES4H

IN : logical unit number of the card reader
 OUT : logical unit number of the printer
 NFEUI : number of maps which have to be checked

TAIN(11) : array of integer numbers
 TALET(27) : array of all the letters
 CC : card code
 NSTAT : State number
 LETPC : map letter
 MANUB : map number
 CFTC : end of cards code
 NUWEL(2) : well numbers

read on
parameter cards

C4H : card code
 NSTDC : State number
 LETDC : map letter
 MNDC : map number
 KS : card continuation code
 DEEP : deepening
 NWDC : well number
 AQU1 : aquifer number
 PCAFR : top of the perforated casing
 PCATO : bottom of the perforated casing
 ATAFR : top of the tapped aquifer
 ATATO : bottom of the tapped aquifer
 TRANS(18) : transmissivity
 COES(15) : storage coefficient
 TF(3) : type of test

read on data
cards

TFOR(1000) : array of all well numbers
 TCS(1000) : array of all cards continuation code
 NN : index of both arrays

```

PROGRAM TES4#
DIMENSION TAIN(11),TALET(27),NUWEL(2),TRANS(18),COES(15),TT(3),
1FONU(2),TFOR(1000),TCS(1000)
INTEGER TFOR,TCS,OUT
IN=6)
OUT=51
CALL BCDERSET(IN,2)
C **** READING OF PARAMETER CARDS ****
READ(IN,100)NFEUI
100 FORMAT(I2)
READ(IN,101)(TAIN(I),I=1,11)
101 FORMAT(11A1)
READ(IN,102)(TALET(J),J=1,27)
102 FORMAT(27A1)
DO 1000 IJK=1,NFEUI
  JN=0
  READ(IN,103)CC,NSTAT,LETDC,MANUB,CFTC
103 FORMAT(A2,2A1,A4,A2)
  READ(IN,104)(NUWEL(I),I=1,2)
104 FORMAT(2I5)
C **** READING OF DATA CARDS ****
133 READ(IN,105)CH,NSTDC,LETDC,MNDC,KS,DEEP,NWDC,AQUI,PCAFR,PCATO,
  1ATAFR,ATATO,TT(1),(TRANS(I),I=1,6),(COES(J),J=1,5),TT(2),(TRANS(I)
  2,I=7,12),(COES(J),J=6,10),TT(3),(TRANS(I),I=13,18),(COES(J),J=11,
  315),(FONU(K),K=1,2)
105 FORMAT(A2,2A1,A4,I1,A1,I5,A1,4F4.0,36A1,10X,2A1)
  IF(CH-CFTC)1,2,1
  1 IF(CH-CC)3,4,3
  3 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
  4 IF(NSTDC-NSTAT)5,6,5
  5 WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
  6 IF(LETDC-LETDC)7,8,7
  7 WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
  8 IF(MNDC-MANUB)9,11,9
  9 WRITE(OUT,109)NWDC
109 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
  11 DO 1) I=1,11
    IF(DEEP-TAIN(I))10,12,10
  10 CONTINUE
  WRITE(OUT,110)NWDC
110 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEEPENING*)
  12 IF(NWDC-NUWEL(1))13,14,14
  14 IF(NWDC-NUWEL(2))15,15,13
  13 WRITE(OUT,111)NWDC
111 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
  15 IF(PCAFR-PCATO)17,18,18
  18 WRITE(OUT,113)NWDC
113 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEPTH OF THE PERFORATED CASING
  1*)
  17 IF(ATAFR-ATATO)19,21,21
  21 WRITE(OUT,114)NWDC
114 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEPTH OF THE TAPPED AQUIFER*)
  19 DO 3) I=1,3
    DO 4) J=1,5
    IF(TT(I)-TAIN(J))40,30,40
  40 CONTINUE
  WRITE(OUT,115)NWDC
115 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE TYPE OF TEST*)
30 CONTINUE

```

```

      DO 50 I=1,10
      DO 60 J=1,11
      IF(TRANS(I)-TAIN(J))60,50,60
60  CONTINUE
      WRITE(OUT,116)NWDC
116  FORMAT(2X,*WELL NUMBER *,I5,* ERROR TRANSMISSIVITY*)
      DO 70 I=1,10
      DO 80 J=1,11
      IF(COES(I)-TAIN(J))80,70,80
80  CONTINUE
      WRITE(OUT,117)NWDC
117  FORMAT(2X,*WELL NUMBER *,I5,* ERROR STORAGE COEFFICIENT*)
      DO 90 I=1,2
      DO 120 J=1,11
      IF(FNU(I)-TAIN(J))120,90,120
120  CONTINUE
      WRITE(OUT,118)NWDC
118  FORMAT(2X,*WELL NUMBER *,I5,* ERROR FOLIO NUMBER*)
      DO 90 CONTINUE
      DO 130 I=3,11
      IF(DEEP-TAIN(I))130,131,130
130  CONTINUE
      GO TO 132
131  NWDC=(I-2)*1000000+NWDC
132  NN=NI+1
      TFOR(NN)=NWDC
      TCS(NN)=KS
      GO TO 133
      2 CALL VECOSU(TFOR,TCS,NN)
1000 CONTINUE
      WRITE(OUT,119)
119  FORMAT(2X,*END OF THE PROGRAM YES4H*)
      STOP
      END

```

Appendix 9Program TES4I

IN : logical unit number of the card reader
 OUT : logical unit number of the printer
 NFEUI : number of maps which have to be checked

TAIN(11) : array of integer numbers
 TALET(27) : array of letters
 CC : card code
 NSTAT : State number
 LETPC : map letter
 MANUB : map number
 CFTC : end of cards code
 NUWEL(2) : well number

read on
parameter cards

C4I : card code
 NSDC : State number
 LETDC : map letter
 MNDC : well number
 KS : card continuation code
 DEEP : deepening
 NWDC : well number
 AQU1 : aquifer tapped
 TT : type of test
 FBTS(5) : flow rate before test starts
 PBTS(4) : pressure before test starts
 UNIT(4) : unit in which the pressure is expressed
 DATE(10) : date of beginning of the test
 IHEU(3), MIN(3) : time in hour and minutes of the measurements
 FLOW(8) : flow
 PRES(8) : pressure
 TTS : following type of test
 FONU(2) : folio number

read on data
card

TFWR(1000) : array of all well numbers
 TCS(1000) : array of all cards continuation code
 NN : index of both arrays

```

PROGRAM TES4I(INPUT,OUTPUT,TAPE60=INPUT,TAPE61=OUTPUT)
  DIMENSION TAIN(13),NUWEL(2),FRBTS(5),POTS(4),UNIT(4),DATE(10),
  1IHEU(3),MIN(3),FLOW(12),PRES(12),TALET(27),TFOR(1000),TCS(1000),
  2LTIME(5),FONU(2)
  INTEGER OUT,TFOR,TCS
  OUT=61 $ IN=60
C *** READING OF PARAMETER CARDS ***
  READ(IN,1000)NFEUI
1000 FORMAT(I2)
  READ(IN,188)(TAIN(I),I=1,13)
  188 FORMAT(13A1)
  READ(IN,1001)(TALET(J),J=1,27)
1001 FORMAT(27A1)
  DO 2000 IJK=1,NFEUI
    NN=0
    READ(IN,101)CC,NSTAT,LETPC,MANUB,CFTC
  101 FORMAT(A2,2A1,A4,A2)
    READ(IN,102)(NUWEL(I),I=1,2)
  102 FORMAT(2I5)
C *** READING OF DATA CARDS ***
203 READ(IN,103)C4I,NSDC,LETDC,MNDC,KS,DEEP,NWDC,AQUI,TT,(FRBTS(I),I=1
  1,5),(POTS(J),J=1,4),UNIT(1),(DATE(K),K=1,10),IHEU(1),MIN(1),(FLOW(
  2L),L=1,4),(PRES(M),M=1,4),UNIT(2),IHEU(2),MIN(2),(FLOW(L),L=5,8),
  3(PRES(M),M=5,8),UNIT(3),IHEU(3),MIN(3),(FLOW(L),L=9,12),(PRES(M),
  4M=9,12),UNIT(4),TTS,(FONU(N),N=1,2)
103 FORMAT(A2,2A1,A4,I1,A1,I5,22A1,3(2I2,9A1),1X,3A1)
  IF(C4I-CFTC)1,2,1
  1 IF(C4I-CC)3,4,5
  3 WRITE(OUT,104)NWDC
104 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
  4 IF(NSDC-NSTAT)5,6,5
  5 WRITE(OUT,105)NWDC
105 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
  6 IF(LETPC-LETDC)7,8,7
  7 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
  8 IF(MNDC-MANUB)9,11,9
  9 WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
  11 DO 1) I=1,11
    IF(DEEP-TAIN(I))10,12,10
  10 CONTINUE
  WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEERING*)
  12 IF(NWDC-NUWEL(1))13,14,14
  14 IF(NWDC-NUWEL(2))15,15,13
  13 WRITE(OUT,109)NWDC
109 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
  15 DO 2) I=3,4
    IF(TT-TAIN(I))20,17,20
  20 CONTINUE
  WRITE(OUT,212)NWDC
212 FORMAT(2X,*WELL NUMBER *,I5,* ERROR TYPE OF TEST*)
  17 LTT=I-2
  DO 3) I=1,5
  DO 4) J=1,13
    IF(FRBTS(I)-TAIN(J))40,30,40
  40 CONTINUE
  WRITE(OUT,112)NWDC
112 FORMAT(2X,*WELL NUMBER *,I5,* ERROR FLOW RATE BEFORE TEST STARTS*)
  30 CONTINUE
  DO 5) I=1,4

```

```

DO 60 J=1,13
  IF(PITS(I)-TAIN(J))60,50,60
60 CONTINUE
  WRITE(OUT,115)NWDC
113 FORMAT(2X,*WELL NUMBER *,15,* ERROR PRESSURE BEFORE TEST STARTS*)
50 CONTINUE
  DO 70 I=1,4
  DO 80 J=1,4
  IF(UJIT(I)-TAIN(J))80,70,80
80 CONTINUE
  WRITE(OUT,114)NWDC
114 FORMAT(2X,*WELL NUMBER *,15,* ERROR PRESSURE UNIT CODE*)
70 CONTINUE
  DO 90 I=1,10
  DO 100 J=1,13
  IF(DATE(I)-TAIN(J))100,90,100
100 CONTINUE
  WRITE(OUT,113)NWDC
115 FORMAT(2X,*WELL NUMBER *,15,* ERROR DATE*)
90 CONTINUE
  DO 110 I=1,3
110 LTIME(I)=INEQ(I)*60+MIN(I)
  DO 120 J=2,3
  IF(LTIME(J)-LTIME(J-1))18,18,120
120 CONTINUE
  GO TO 21
18 IF(LTIME(J))19,21,19
19 WRITE(OUT,116)NWDC
116 FORMAT(2X,*WELL NUMBER *,15,* TIME OF MEASURE NOT INCREASING*)
21 DO 130 I=1,12
  DO 140 J=1,13
  IF(FLOW(I)-TAIN(J))140,130,140
140 CONTINUE
  WRITE(OUT,117)NWDC
117 FORMAT(2X,*WELL NUMBER *,15,* ERROR FLOW MEASUREMENT*)
130 CONTINUE
  DO 150 I=1,12
  DO 160 J=1,13
  IF(PRES(I)-TAIN(J))160,150,160
160 CONTINUE
  WRITE(OUT,118)NWDC
118 FORMAT(2X,*WELL NUMBER *,15,* ERROR PRESSURE MEASUREMENT*)
150 CONTINUE
  IF(LTT-1)331,332,331
331 DO 330 J=1,12
  IF(PRES(J)-TALET(1))333,330,333
330 CONTINUE
  GO TO 334
333 WRITE(OUT,335)NWDC
335 FORMAT(2X,*WELL NUMBER *,15,* TYPE OF TEST IS NOT COHERENT WITH TH
1E PRES. MEASUREMENT*)
  GO TO 334
332 DO 340 K=1,12
  IF(FLOW(K)-TALET(1))341,340,341
340 CONTINUE
  GO TO 334
341 WRITE(OUT,336)NWDC
336 FORMAT(2X,*WELL NUMBER *,15,* TYPE OF TEST IS NOT COHERENT WITH TH
1E FLOW MEASUREMENT*)
334 DO 170 I=1,4
  IF(TTS-TAIN(I))170,22,170
170 CONTINUE
  WRITE(OUT,119)NWDC

```

```
19 FORMAT(2X,'WELL NUMBER ',I5,' ERROR FOLLOWING TYPE OF TEST*')
22 DO 130 I=1,2
   DO 140 J=1,13
   IF(FONU(I)-TAIN(J))190,180,190
190 CONTINUE
   WRITE(OUT,121)NWDC
121 FORMAT(2X,'WELL NUMBER ',I5,' ERROR FOLIO NUMBER*')
180 CONTINUE
   DO 200 K=3,11
   IF(DEEP-TAIN(K))200,201,200
200 CONTINUE
   GO TO 203
201 NWDC=(K-2)*100000+NWDC
202 NN=NI+1
   TCS(NN)=KS
   TFOR(NN)=NWDC
   GO TO 203
2 CALL VECOSU(TFOR,TCS,NN)
2000 CONTINUE
   WRITE(OUT,122)
122 FORMAT(2X,'END OF THE PROGRAM TES4(*)')
   STOP
   END
```

Appendix 10Program TES4K

IN	:	logical unit number for the card reader	}	read on parameter cards
OUT	:	logical unit number for the printer		
NFEUI	:	number of maps which have to be checked		

TAIN(11)	:	array of integer numbers	}	read on parameter cards
CC	:	card code		
NSTAT	:	State number		
LETFC	:	map letter		
MANUB	:	map number		
CFTC	:	end of cards code		
NUWEL(2)	:	well number		

C4K	:	card code	}	read on data cards
NSTDC	:	State number		
LETDC	:	map letter		
MNDC	:	map number		
KO	:	card continuation code		
DEEP	:	deepening		
NWDC	:	well number		
AQUI	:	tapped aquifer		
YEAR(3, 7)	:	date of measurement		
UNIT(7)	:	unit of measurement		
TDS(5, 7)	:	total dissolved solids measurements		
LTAR(3, 7)	:	date of measurement in integers		
JIME(7)	:	date in years		

TFOR(1000)	:	array of all well numbers
TKO(1000)	:	array of all card continuation code
NN	:	index of both arrays

```

PROGRAM TES4K
DIMENSION NUWEL(2),TAIN(11),YEAR(3,7),UNIT(7),TDS(5,7),LTAR(3,7),
1JINE(7),TKO(1000),TEOR(1000)
INTEGER OUT,TEOR,TKO
IN=61
OUT=51
CALL BODERSET(IN,2)
C *** READING OF PARAMETER CARDS ***
READ(IN,1000)NFEUI
1000 FORMAT(I2)
READ(IN,102)(TAIN(I),I=1,11)
102 FORMAT(11A1)
DO 2000 IJK=1,NFEUI
NN=0
READ(IN,100)CC,NSTAT,LETPC,MANUB,CFTC
100 FORMAT(A2,2A1,A4,A2)
READ(IN,101)(NUWEL(I),I=1,2)
101 FORMAT(2I5)
C *** READING OF DATA CARDS ***
250 READ(IN,103)C4K,NSTDC,LETDC,MNDC,KO,DEEP,NWDC,AQOI,((YEAR(J,I),J=1
1,3),UNIT(I),(TDS(K,I),K=1,5),I=1,7)
103 FORMAT(A2,2A1,A4,I1,A1,I5,A1,7(9A1))
IF(C4K-CFTC)1,2,1
1 IF(C4K-CC)3,4,3
3 WRITE(OUT,104)NWDC
104 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE CARD*)
4 IF(NSTDC-NSTAT)5,6,5
5 WRITE(OUT,105)NWDC
105 FORMAT(2X,*WELL NUMBER *,I5,* ERROR STATE NUMBER*)
6 IF(LETDC-LETPC)7,8,7
7 WRITE(OUT,106)NWDC
106 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP LETTER*)
8 IF(MNDC-MANUB)9,11,9
9 WRITE(OUT,107)NWDC
107 FORMAT(2X,*WELL NUMBER *,I5,* ERROR MAP NUMBER*)
11 DO 10 I=1,11
IF(DEEP-TAIN(I))10,12,10
10 CONTINUE
WRITE(OUT,108)NWDC
108 FORMAT(2X,*WELL NUMBER *,I5,* ERROR DEEPENING*)
12 IF(NWDC-NUWEL(1))13,14,14
14 IF(NWDC-NUWEL(2))15,15,13
13 WRITE(OUT,109)NWDC
109 FORMAT(2X,*WELL NUMBER *,I5,* ERROR WELL NUMBER*)
15 DO 30 I=1,7
DO 40 J=1,5
IF(UNIT(I)-TAIN(J))40,30,40
40 CONTINUE
WRITE(OUT,111)NWDC
111 FORMAT(2X,*WELL NUMBER *,I5,* ERROR CODE UNIT OF MEASMT*)
30 CONTINUE
DO 50 I=1,7
DO 60 J=1,5
DO 70 K=1,11
IF(TDS(J,I)-TAIN(K))70,60,70
70 CONTINUE
WRITE(OUT,112)NWDC
112 FORMAT(2X,*WELL NUMBER *,I5,* ERROR TDS MEASMT,*)
60 CONTINUE
50 CONTINUE
DO 200 I=1,7
DO 210 J=1,5

```

```
      DO 230 K=1,11
      IF(YEAR(J,I)-TAIN(K))220,211,220
220  CONTINUE
      WRITE(OUT,113)NWDC
113  FORMAT(2X,*WELL NUMBER *,I5,* ERROR DATE OF TEASMT*)
      GO TO 211
211  IF(K-1)3)1,3)2,3)1
301  LTAR(J,I)=K-2
      GO TO 211
302  LTAR(J,I)=K-1
210  CONTINUE
200  CONTINUE
      DO 230 I=1,7
230  JIME(I)=LTAR(1,I)*100+LTAR(2,I)*10+LTAR(3,I)
      DO 240 K=1,6
      IF(JIME(K)-JIME(K+1))240,240,241
241  IF(JIME(K+1))242,240,242
242  WRITE(OUT,114)NWDC
114  FORMAT(2X,*WELL NUMBER *,I5,* DATA ARE OUT OF SEQUENCE*)
240  CONTINUE
      DO 888 K=3,11
      IF(DEEP-TAIN(K))888,999,888
888  CONTINUE
      GO TO 993
999  NWDC=(K-2)*100000+NWDC
998  NN=NN+1
      TKO(NN)=KO
      TFOR(NN)=NWDC
      GO TO 250
      2 CALL VECJSU(TFOR,TKO,NN)
2000 CONTINUE
      WRITE(OUT,115)
115  FORMAT(2X,*END OF THE PROGRAM TES4K *)
      STOP
      END
```

Appendix 11Program CØVET

IN	:	logical unit number of the card reader
OUT	:	logical unit number of the printer
TCC(12)	:	array of all cards code except 4A
TCCIC(3)	:	array of cards code where the folio number is only written in column 80
CFTC	:	end of cards code
NBC4A	:	number of master cards
FEU	:	map number read on the master card
NUWEL	:	well number read on the master card
LNCET(12)	:	array of the cards available
LTFOR(1000)	:	array of all well numbers
TFEU(1000)	:	array of all map numbers
LTCET(1000,12)	:	array of the cards available for all the wells
KK	:	index of the number of cards having the same well number
CC	:	card code
FEUI	:	map number read on cards 4B, 4C, 4K
KS	:	card continuation code
NWDC	:	well number read on cards other than master cards
NFO	:	folio number
LTNFO	:	array of folio number
NUZO	:	index of the type of card

```

PROGRAM COVET(INPUT,OUTPUT,TAPE60=INPUT,TAPE61=OUTPUT)
DIMENSION TCC(12),TCCIC(3),LNCET(12),LTFOR(1000),LTCET(1000,12),
1LTNFO(100),TFEU(1000)
INTEGER OUT
IN=61
OUT=61
READ(IN,100)(TCC(I),I=1,12),(TCCIC(J),J=1,3),CFTC
100 FORMAT(15A2)
READ(IN,101)NBC4A
101 FORMAT(I5)
DO 1) I=1,NBC4A
READ(IN,102)FEU,NWEL,(LNCET(J),J=1,12)
102 FORMAT(3X,A5,1X,I6,43X,2I2,I1,3I2,I1,I2,2I1,2I2)
LTFOR(I)=NWEL
TFEU(I)=FEU
DO 2) K=1,12
20 LTCET(I,K)=LNCET(K)
10 CONTINUE
42 KK=1
35 READ(IN,103)CC,FEUI,KS,NWDC,NFO
103 FORMAT(A2,1X,A5,I1,I6,63X,I2)
IF(CC-CFTC)1,2,1
1 DO 3) I=1,3
IF(CC-TCCIC(I))30,31,30
30 CONTINUE
GO TO 32
31 NFO=NFO-(NFO/10*10)
32 LTNFO(KK)=NFO
IF(KK)33,34,33
33 KK=KK+1
GO TO 35
34 DO 4) I=1,NBC4A
IF(NWDC-LTFOR(I))40,41,40
40 CONTINUE
WRITE(OUT,104)NWDC,CC
104 FORMAT(2X,*WELL NUMBER *,I6,* IN CARD SET *,A2,* IS NOT ACCOUNTED
1 FOR IN THE MASTER CARD SET*//)
GO TO 42
41 IF(FEUI-TFEU(I))48,47,48
48 WRITE(OUT,49)NWDC,CC
49 FORMAT(2X,*WELL NUMBER *,I6,* MAP NUMBER IS NOT THE SAME IN MASTER
1 FILE AND SET *,A2//)
47 DO 5) J=1,12
IF(CC-TCC(J))50,51,50
50 CONTINUE
51 NUZO=J
IF(KK-LTCET(I,NUZO))43,44,43
43 WRITE(OUT,105)NWDC,CC
105 FORMAT(2X,*WELL NUMBER *,I6/2X,*THE NUMBER OF CARDS AVAILABLE AS
1 READ ON CARD 4A DOES NOT CORRESPOND TO THE NUMBER OF CARDS *,A2//)
44 IF(KK-1)42,42,45
45 DO 6) I=2,KK
IF(LTNFO(I-1)-LTNFO(I))60,61,61
60 CONTINUE
GO TO 42
61 WRITE(OUT,106)NWDC,CC
106 FORMAT(2X,*WELL NUMBER *,I6,* SET *,A2,* FOLIO NUMBERING NOT INCR
1EASING*//)
GO TO 42
2 WRITE(OUT,107)
107 FORMAT(2X,*END OF THE PROGRAM COVET*)
STOP
END

```