

**A NATIONAL GROUNDWATER DATA
BASE FOR SOUTH AFRICA-TECHNICAL
SPECIFICATIONS**

By VE Cogho, J Kirchner & JW Morris

WRC Report No 150 /3/ 89

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 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

**V E COGHO
J KIRCHNER
J W MORRIS**

**A NATIONAL GROUND-WATER
DATA BASE FOR SOUTH AFRICA
- TECHNICAL SPECIFICATIONS**

Report to the
WATER RESEARCH COMMISSION
by the
INSTITUTE FOR GROUND-WATER STUDIES
UNIVERSITY OF THE ORANGE FREE STATE

WRC Report No 150/3/89

[illegible]

A NATIONAL GROUND-WATER DATA BASE FOR SOUTH AFRICA
- TECHNICAL SPECIFICATIONS

by

V E COGHO
J KIRCHNER
J W MORRIS

Institute for Ground-water Studies

University of the Orange Free State
Bloemfontein, South Africa

WRC Report No. 150/3/89

ACKNOWLEDGMENTS

The research described in this report resulted from a project funded by the Water Research Commission entitled:

"The development of a National Data Bank for ground-water data."

The Steering Committee responsible for this project, consisted of the following persons:

Dr P J T Roberts	Water Research Commission (Chairman)
Mr H M du Plessis	Water Research Commission
Mr P Weideman	Water Research Commission (Secretary)
Prof H J Potgieter	University of the OFS
Mr J R Vegter	Directorate of Geohydrology, Dept of Water Affairs
Mr F G de Kock	Directorate of Computer Services, Dept of Water Affairs
Mr J Nel	Directorate of Computer Services, Dept of Water Affairs
Dr C P R Roberts	Directorate of Planning Services, Dept of Water Affairs
Mr M W Selibowitz	Directorate of Planning Services, Dept of Water Affairs
Mr R J Connelly	Steffen, Robertson & Kirsten
Prof J Kirchner	Institute for Ground-water Studies, University of the OFS
Prof F D I Hodgson	Institute for Ground-water Studies, University of the OFS

The financing of the project by the Water Research Commission and the contributions of the members of the Steering Committee are acknowledged gratefully.

NATIONAL GROUND-WATER DATA BASE

TECHNICAL SPECIFICATIONS

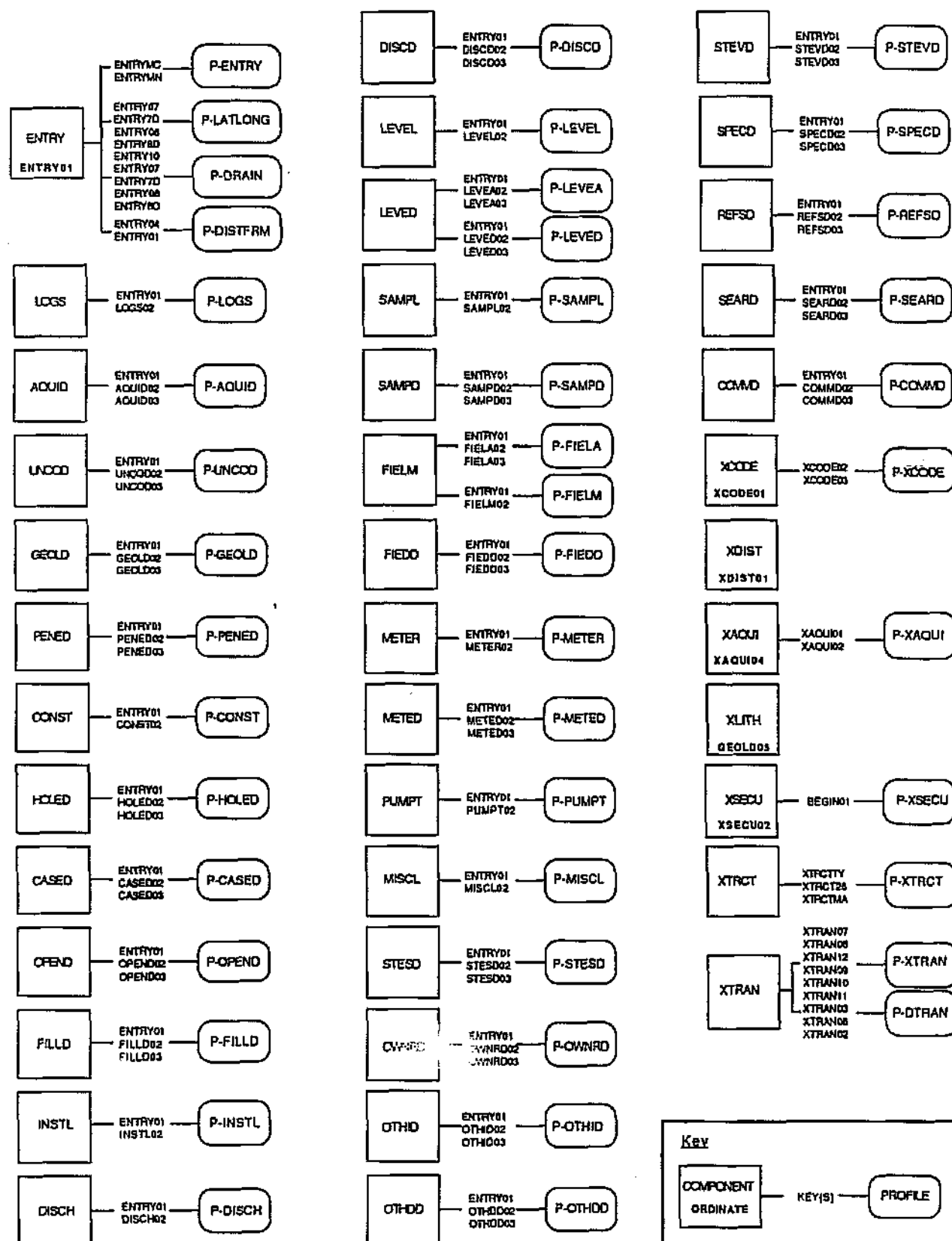
CONTENTS

- 1 COMPONENTS
 - 1.1 COMPONENTS IN LOGICAL SEQUENCE
 - 1.2 COMPONENTS, PROFILES AND ORDINATES
 - 1.3 DATA BASE SCREENS
- 2. DATA DICTIONARY
 - 2.1 EPLANATION
 - 2.2 DATA SET LISTS
- 3 FUNCTIONAL DECOMPOSITION
- 4 DATA SET POPULATIONS
- 5 MAINTENANCE
 - 5.1 PROGRAM MAINTENANCE
 - 5.2 CODE MAINTENANCE
 - 1 XCODE - CODE LISTS
 - 2 XDIST - DISTRICT CODES
 - 3 XAQUI - AQUIFER CODES
 - 4 XLITH - LITHOLOGY CODES
 - 5 XSECU - USER IDENTIFICATIONS AND PASSWORDS
 - 6. MASTERPASSWORD AND REPORTING INSTITUTION
 - 5.3 XCODE TABLES IN NUMERICAL SEQUENCE
- 6 TRANSACTION LOGS
 - 6.1 BOREHOLE/LINCLOG
 - 6.2 LOGGER
- 7 LINC CODING STANDARDS
- 8 QUME QVT109 TERMINAL STATUS LINE SETTINGS
- 9 NOTES
 - 9.1 NOTES FOR DATAPOINT PROGRAMMER
 - 9.2 PROGRAM MAINTENANCE NOTES
- 10 REFERENCE MANUALS

1 COMPONENTS IN LOGICAL SEQUENCE

BEGIN	Log-on Screen
SITE	Main menu Screen
ENTRY	Entry Data
LOGS	Logs Header
PENED	Penetration rate Repeating group
AQUID	Aquifer Repeating group
GEOLD	Geology Repeating group
CONST	Construction Header
HOLED	Hole Repeating group
CASED	Casing Repeating group
OPEND	Openings Repeating group
FILLD	Fill Repeating group
INSTL	Installation Header
DISCH	Discharge rate Header
DISCD	Discharge rate Repeating group
LEVEL	Water-level Header
LEVED	Water-level Repeating group
LEVEA	Water level (automatic)
SAMPL	Water sample Header
SAMPD	Water sample Repeating group
FIELM	Field measurement Header
FIEDD	Field measurement Repeating group
FIELA	Field measurement (automatic)
METER	Meter reading Header
METED	Meter reading Repeating group
PUMPT	Pumping test Header
MISCL	Miscellaneous Header
STESD	Site selection Repeating group
OWNRD	Owner repeating group
OTHID	Other identifier Repeating group
OTHDD	Other data Repeating group
STEVD	Site visits Repeating group
SPECD	Special cases Repeating group
REFSD	References Repeating group
SEARD	Search status Repeating group
COMMD	Comments Repeating group
XINQU	Inquiry set-up Screen
XCODE	General codes
XDIST	Province and District codes
XAQUI	Aquifer codes
XLITH	Lithology codes
XTRCT	Inquiry extract parameters
XSECU	User security codes

Components, profiles and ordinates of the data base



I COMPONENTS 3

LOGON - Menu-Assisted Resource Control	11:19 AM	MARC
Welcome.		
Please enter your user code [	]	
...and your password	]	

LOGON MARC]PLEASE DEPRESS 'XNT' TO DETACH TERMINAL [	]]	]
--	----	---

Figure I.1: LOGON -and LOG-OFF Screens

1 COMPONENTS 4

MARC - MENU-ASSISTED RESOURCE CONTROL				10:48 AM	
Action: [DN BOREHOLE				J	
Home Prev GO Parent Cmdnd				(Press SPCFY for Help)	
	Session]	Windows]		Files]	
TEACH	What is MARC?	WINDOW	Current Windows	DIR	List My Files
SPLIT	Print Backup File	CANDE	Cande Window	COPY	Copy File
BYE	Log Off	ON	Change Window	CHANGE	Change File Name
USER	Usercode/Password			REMOVE	Remove File
FAMILY	Show Family		Jobs and Tasks]	SEC	Change Security
CHFAM	Change Family	IE	InfoExec	INFO	Show File Info
SC	Session Control	TOOLS	Application Tools	FILE	File Management
	Messages]	UTIL	System Utilities		
SEND	Send Message	RUN	Run a Task		System Software]
MSG	Read Message	START	Start a WFL Job	SHOW	Show Print Queue
NEWS	Read News	JDC	Job Disp/Control	PS	Printing System
				COMS	COMS Displays
				SYSINF	System Info
Choice: [					
Unisys 87900:432 MARC 37.230.706 (COMS 37.230.723) NETWORK.					
User = WIGS; Session = 520.					

< TERMINAL CONFIGURATION OPTIONS (TCOS VER 2.3)	
Data Comm Options:	
[Y] Beep on NAK	[Y] Receive Mode Hold
[Y] DC1 RCV Mode Hold	[Y] SPCFY Key Sends ASCII
[N] Trans Numbers Enabled	[Y] O/I Trans No.(Y) @/A(N)
Screen Formatting Options:	
[Y] Auto Forms Skip	[N] Forms Xmt To Cursor
[N] Lower Case Lockout	[N] Dcom LF->CR [Y] Dcom CR->LF
[1F] Open Alt Form Delim	[1E] Close Alt Form Delim
[N] Line-At-A-Time Xmit	[N] SOH Clears Screen
[N] HT [N] CR [N] ETX Write From Dcom	
[Y] Cursor Wraparound	[N] HT [N] CR Write From Kybd
[N] ETX Advance Cursor	[N] Fixed Tabs
[N] CLEAR = Clear Form	[Y] Kybd CR/LF
[Y] SOH Exit Form Mode	[N] VT Page Advance
[N] FF = Clear Tabs	[N] DC2 Adv DCP(Y) DC2 Frm Tag(N)
[Y] Tab Retain	
[N] Video Option	
Copyright (C) 1987,1988 Diginet Systems (Pty) Ltd.	

Figure 1.2: MARC- and Terminal Configuration Options Screens

1 COMPONENTS 5

<N000]National Ground-water Data Base [[[]

<TBEGIN00001107OCT88]<BB10]

N A T I O N A L G R O U N D - W A T E R D A T A B A S E

DEVELOPED BY:

Institute for Ground-water Studies
University of the Orange Free State
Bloemfontein 1987

I
G
UOF5

v3.0 (July 1987)

Important announcement from Data Base Administrator:

Identification [Password]

Figure 1.3: Page 2 and Page 1 of the first Data Base Screens

<TI<139><SITE 1<0000671<23AUG85>
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

E N T R Y

Site identification code map no sequence no
 [] ^ 0]

Default Reporting institution [XXXX]

Current computer date <19850823>

TAB OVER NEXT TWO FIELDS UNLESS CHANGING/DELETING AN EXISTING
HEADER, REPEATING GROUP OR NEXT SCREEN <SEE: User Manual>

Header sequence number ^ 0]

Repeating group number ^ 0]

Use HELP for listing of possible next screen numbers on page 2

Next screen number ^ 10][0]

<TI<139><ENTRY1<0000671<23AUG85> [ADD]
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code

E N T R Y < D E T A I L >

Site id code <2424AD00006> Map no [2424AD] Number on map ^ 6]

Distr & farm no [] Site name[]

Topo setting [] Latitude ^24] ^ 0] Longitude ^24] ^ 0]

Accuracy [] Drainage region [] Altitude ^9999.99][+] method []

Site: type [] selector [] Diameter ^ 0]

Completed: depth^ 0] date ^ 0] information source []

Site status [] purpose [] Water use: consumer [] application []

Reporting institution [IGS] Equipment [] Potability []

Date: entered <19850823> updated <19850823> Comment []

Next screen number ^ 22][0]

Figure 1.4: Entry Header and Detail Screens (Screens 1 and 10)

<T1<139><LOGS ><000068><23AUG85>
Accepted codes: ADD, CHG, DEL or INB - 'HOME' cursor to change code [ADD]

LOGS

Site id code <2424AD000063>
Header seq no ^ 13
Reporting institution [IGS]
Date record entered <19850823>[03]

<T1<139><PENED><000202><30AUG85>
Accepted codes: ADD, CHG, DEL or INB - 'HOME' cursor to change code [ADD]

PENETRATION RATE <DETAIL>

KEY <2424AD000001> ^ 13
Repeating group number ^ 13
Depth to top ^ 03
Depth to bottom ^ 03
Diameter of interval ^ 03
Penetration rate ^ 03
Comment [] Next screen number ^ 01[03]

Figure 1.5: Logs Header and Penetration Rate Detail Screens (Screens 20 and 21)

TAQUID000018120CT88J<8810J
Accepted codes: ADD, CHG, DEL or [NQ - "HOME" cursor to change code [ADD]

A Q U I F E R < D E T A I L >

KEY	<2926DA99999J	~	1J
Repeating group number		~	1J
Depth to top		~	0J
Depth to bottom		~	0J
Aquifer code	[		J
Comment	[		J

Next screen number ~ 0J[0J

Figure 1.6: Aquifer Detail Screen (Screen 22)

CTUNCDD000020120CT881<8810>

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

UNCONSOLIDATED <DETAIL>

KEY <2926DA99999> ^ 2]

Repeating group number ^ 1]

Depth to top ^ 0]

Lithology code []

Colour: prim. [] sec. []

Texture []

Feature: prim. [] sec. [] attrib. []

Sorting []

Roundness []

Sieve analysis %: clay silt sand granl pebbi cobbl boulder
 ^ 0] ^ 0] ^ 0] ^ 0] ^ 0] ^ 0] ^ 0]

Comment []

Next screen number ^ 0][0]

CTGEOLD000026120CT881<8810>

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

CONSOLIDATED <DETAIL>

KEY <2926DA99999> ^ 4]

Repeating group number ^ 1]

Depth to top ^ 0]

Lithology code []

Colour: prim. [] sec. []

Texture []

Feature []

Comment []

Next screen number ^ 0][0]

Figure 1.7: Unconsolidated -and Consolidated Detail Screens (Screens 23 and 24)

<T1<1391<CONST1<0002051<30AUG85>

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

C O N S T R U C T I O N

Site id code	<2424AD00001>	Header seq number	^ 00
Piezometer number	^00	Reporting Institution	[IGS]
Date record entered	<19850830>	Date of construction	^ 00
Contractor	[	Data source	[]
Method - construction	[]	Type of finish	[]
Method - development	[]	Duration - development	^ 00
Special treatment	[]	Cost of construction	^ 00
Comment	[		1[00]

<T1<1391<HOLE01<0002061<30AUG85>

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

H O L E < D E T A I L >

KEY	<2424AD00001>	^ 00
Repeating group number	^ 00	
Depth to top	^ 00	
Depth to bottom	^ 00	
Diameter	^ 00	
Comment	[	
		Next screen number ^ 01[00]

Figure 1.8: Construction Header and Hole Detail Screens (Screens 30 and 31)

<TJ<139J<CASEDJ<000207J<30AUG85J

Accepted codes: ADD, CHG, DEL or INC - 'HOME' cursor to change code [ADD]

C A S I N G <D E T A I L>

KEY <2424AD00001J ^ 3J

Repeating group number ^ 1J

Depth to top ^ 0J[+J

Depth to bottom ^ 0J

Diameter ^ 0J

Material [J

Thickness ^ 0J

Comment [J

Next screen number ^ 0J[0J

<TJ<139J<OPENDJ<000208J<30AUG85J

Accepted codes: ADD, CHG, DEL or INC - 'HOME' cursor to change code [ADD]

O P E N I N G S <D E T A I L>

KEY <2424AD00001J ^ 3J

Repeating group number ^ 1J

Depth to top ^ 0J

Depth to bottom ^ 0J

Diam of open interval ^ 0J Material [J

Type of openings [J Length ^ 0J

Width ^ 0J Horizontal dist betw openings ^ 0J

Vertical dist betw openings ^ 0J Method made [J

Comment [J Next screen number ^ 0J[0J

Figure 1.9: Casing- and Openings Screens (Screens 32 and 33)

```

<TJ<1391<FILLD1<0002091<30AUG85J
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

      F I L L   <D E T A I L>

KEY      <2424AD0000013      ^  0J
Repeating group number      ^  1J
Depth to top                ^  0J
Depth to bottom             ^  0J
Type of fill                [  ]
Comment                     [      ]

                                Next screen number      ^  01[0J
                                _____

```

```

<TJ<1391<INSTL1<0002171<30AUG85J
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

      I N S T A L L A T I O N

Site id code      <2424AD0000013      Record sequence no      ^  1J
Reporting Institution    [IGS ]      Date entered      <19850830J
Date of installation ^      0J      Type of installation    [  ]
Depth to intake         ^      0J      Type of power        [  ]
Power rating            0J      Manufacturer [      ]
Serial number          [      ]      Power meter number [      ]
Monitoring facility     [  ]      Data source          [  ]
Comment                [      ]      Next screen number      ^  01[0J

```

Figure 1.10: Fill Detail and Installation Header Screens (Screens 34 and 40)

<TJ<139J<DISCHJ<000077J<23AUG85J

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

DISCHARGE RATE

Site id code <2424AD00006J

Header seq no ^ 1J

Reporting institution [IGS J

Date entered <19850823J

Type [J

Method [J

Information source [1[0J

<TJ<139J<DISCDJ<0000214J<30AUG85J

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

DISCHARGE RATE <DETAIL>

KEY <2424AD00001J ^ 1J

Repeating group number ^ 1J

Date ^ 0J

Time ^2400J

Rate of discharge ^ 0J[+J

Comment [J

Next screen number ^ 0J[0J

Figure 1.11: Discharge Rate Header and Detail Screens (Screens 50 and 51)

<TJ><139J><LEVELI><000079J><23AUG85J
 Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

W A T E R - L E V E L

Site id code <2424AD00006J
 Header seq no ^ 13
 Piezometer no ^0J
 Reporting institution [16S]
 Date entered <19850823J
 Method [1]
 Status [1]
 Collar ^99.99J[+]
 Information source [1][0]

<TJ><140J><LEVEDJ><000712J><25NOV85J ^0511J
 Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

W A T E R - L E V E L <D E T A I L>

KEY <2424AD000021J ^ 23
 Repeating group number ^ 13
 Date ^ 03
 Time ^2400J
 Level ^ 03J[+]
 Comment [1]

Next screen number ^ 03[0]

Figure 1.12: Water-Level Header and Detail Screens (Screens 60 and 61)

```
<T1<1391<SAMPL1<0002191<30AUG851
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]
```

W A T E R S A M P L E

```
Site id code      <2424AD000011
Header seq no       ^ 11
Reporting Institution   [IGS ]
Date record entered <19850830101
```

```
<T1<1391<SAMPD1<0002191<30AUG851
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]
```

W A T E R S A M P L E (D E T A I L)

```
KEY   <2424AD000011   ^ 11
Repeating group number ^ 11
Date of sampling       ^ 01
Time of sampling       <24001
Sample number       [       ]
Comment           [       ]

Next screen number       ^ 0101
```

Figure 1.13: Water Sample Header and Detail Screens (Screens 70 and 71)

<TJ<0121<FIELDJ<012696J<07JUL84J ^8607J
Accepted codes: ADD, CHG, DEL or INQ -'HOME' cursor to change code [ADD]

FIELD MEASUREMENT

Site id code <2424AA000008J
Header seq no ^ 1J
Reporting Institution [IGS J
Date: entered <19860707J[0J

<TJ<0121<FIELDJ<012696J<07JUL84J ^8607J
Accepted codes: ADD, CHG, DEL or INQ -'HOME' cursor to change code [ADD]

FIELD MEASUREMENT <DETAIL>

KEY <2424AA000008J ^ 0J
Repeating group number ^ 1J
Date of measurement ^ 0J
Time of measurement ^2400J
Parameter measured [J
Reading ^ 0J
Comment [J

Next screen number ^ 01[0J

Figure 1.14: Field Measurement Header and Detail Screens (Screens 80 and 81)

```

<TLEVEA000014070CT0881<88103
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [  ]

      W A T E R - L E V E L   ( A U T O M A T I C )

KEY      <198810070003

Date           Time      Level
^999999999]   ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03
^      03     ^2400] ^    03

Next screen number ^ 01[0]

```

```

<TFIELA000014070CT0881<88103
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [  ]

      F I E L D   M E A S U R E M E N T   ( A U T O M A T I C )

KEY      <198810070003

Date           Time      Par      Readno      Depth
^999999999]   ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03
^      03     ^2400] [  ] ^    03 ^    03

Next screen number ^ 01[0]

```

Figure 1.15: Water-level (automatic) and Field Measurement (automatic) (Screens 62 and 82)

<T1<1391<METER1<00002201<30AUG85]

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

METER READING

Site id code	12424AD0000011
Header seq no	^ 11
Reporting Institution	[IGS]
Date: entered	<19850830]
Type of meter	[]
Comment	[]

<T1<1391<METED1<00002211<30AUG85]

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

METER READING <DETAIL>

KEY	<12424AD0000011	^ 11
Repeating group number	^ 11	
Date of reading	^ 03	
Time of reading	^2400]	
Reading	^ 01	
Comment	[]	

Next screen number ^ 0100]

Figure 1.16: Meter Reading Header and Detail Screens (Screens 90 and 91)

```

<TJ<139J<PUMPTJ<000098J<23AUG85J
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

      P U M P I N G   T E S T

Site id code      <2424AD000006J
Header seq no          ^  1J
Reporting institution  [IGS J
Date: record entered <19850823J   pumping started ^      0J
Method tested          [  J
Depth to intake        ^      0J
Recommended abstraction ^      0J
Transmissivity         ^      0J
Storativity           ^      0J
Comment              [      J           Next screen number ^  0J[0J

```

```

<TJ<139J<MISCLJ<000222J<30AUG85J
Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

      M I S C E L L A N E O U S

Site id code      <2424AD000001J
Header seq no          ^  1J
Reporting Institution [IGS J
Date record entered <19850830J[0J

```

Figure 1.17: Pumping Test- and Miscellaneous Screens (Screens 100 and 110)

<T1><140><STESD><000533><05NOV85>
 Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

S I T E S E L E C T I O N < D E T A I L >

KEY <2424AD00001> ^ 43

Repeating group number ^ 13

Description and recommendation

[]

Next screen number ^ 03[3]

<T1><139><OWNRD><000224><30AUG85>
 Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

N A M E O F O W N E R < D E T A I L >

KEY <2424AD00001> ^ 13

Repeating group number ^ 13

Ownership date ^ 03

Name of owner

[]

Next screen number ^ 03[3]

Figure 1.18: Site Selection- and Name of Owner Detail Screens (Screens 111 and 112)

<TJ<1391<0THID1<00002251<00AUG851

Accepted codes: ADD, CHG, DEL or INB - "HOME" cursor to change code [ADD]

OTHER IDENTIFIER (DETAIL)

KEY <2424AD000011 ^ 11

Repeating group number ^ 11

Other identifier []

Assignor []

Next screen number ^ 01E01

<TJ<1391<0THDD1<00002261<00AUG851

Accepted codes: ADD, CHG, DEL or INB - "HOME" cursor to change code [ADD]

OTHER DATA (DETAIL)

KEY <2424AD000011 ^ 11

Repeating group number ^ 11

Data type []

Type of logger []

Location []

Format []

Next screen number ^ 01E01

Figure 1.19: Other Identifier- and Other Data Detail Screens (Screens 113 and 114)

<TJ<139><STEVD1<00002271<00AUG85>

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

S I T E V I S I T S < D E T A I L >

KEY <2424AD000011 ^ 11

Repeating group number ^ 11

Date of visit ^ 01

Visitor I 1

Next screen number ^ 01E01

<TJ<139><SPEC01<00002281<00AUG85>

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

S P E C I A L C A S E S < D E T A I L >

KEY <2424AD000011 ^ 11

Repeating group number ^ 11

Number of holes ^ 01

Depth: deepest hole ^ 01 shallowest hole ^ 01

Method of construction [1 Diameter of group ^ 01

Length pond/tunnel/drain ^ 01 Strike pond/tunnel/drain ^ 01

Dip of tunnel/drain ^ 010+1 Depth of lateral collector ^ 01

Length of lateral ^ 01 Mesh of screen in lateral ^ 01

Next screen number ^ 01E01

Figure 1.20: Site Visits- and Special Cases Screens Detail Screens (Screens 115 and 116)

<T1<1391<REFSD1<0002291<30AUG851
 Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

REFERENCES (DETAIL)

KEY <2424AD000011 ^ 11
 Repeating group number ^ 11
 Reference <Map/Section/Report>
 1 3

Next screen number ^ 01101

<T1<1391<SEARD1<0002301<30AUG851
 Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code [ADD]

SEARCH STATUS (DETAIL)

KEY <2424AD000011 ^ 11
 Repeating group number ^ 11
 Record type and period searched
 1 3

Next screen number ^ 01101

Figure 1.21: References- and Search Status Detail Screens (Screens 117 and 118)


```
<T1<140J<XAQUIJ<000600J<11NOVB5J [ADD]
```

NATIONAL GROUND-WATER DATA BASE

Aquifer code maintenance

Aquifer group code ^ 0J

Aquifer code []

Aquifer name []

Record number ^ 0J <for internal use>[0]

```
<T1<140J<XCODEJ<000600J<11NOVB5J [ADD]
```

Accepted codes: ADD, CHG, DEL or INQ - 'HOME' cursor to change code

NATIONAL GROUND-WATER DATA BASE

General code maintenance screen

Code reference number ^ 0J

Code list number ^ 0J

Code []

Code expansion/description [] [0]

Figure 1.23: XAQUI- and XCODE Screens

<T><140><XDIST><000600><11NOV85> [ADD]

N A T I O N A L G R O U N D - W A T E R D A T A B A S E

District code maintenance screen

District code number []

District name [] [0]

<T><140><XLITH><000600><11NOV85> [ADD]

N A T I O N A L G R O U N D - W A T E R D A T A B A S E

Lithology code maintenance

Lithology code []

Lithology name [] [0]

Figure 1.24: XDIST- and XLITH Screens

```

<TJ<140J<XSECUJ<000600J<11NOV85J [ADDJ
  NATIONAL    GROUND-WATER    DATA    BASE

Master password      ]
User number      ^      0J
User identifier    [              ]
User password      ]
Security level    [ ]
Create date      <19851111J
Expiry date      ^      0J[0J

```

```

<TXCONV00001507OCT88J<8810J[ADDJ
  NATIONAL    GROUND-WATER    DATA    BASE

  Conversion from Flow Station Number to Site Id Number

Flow station    [              ]
Site id        [              ]

Next screen number ^  0J[0J

```

Figure 1.25: XSECU- and XCONC Screens

2. DATA DICTIONARY

EXPLANATION

1 ITEM NUMBER

Assigned by IGS for User Manual cross-reference.

2 DESCRIPTION

Description of item as given on the data sheet and specifications.

3 REQUIRED/OPTIONAL CODE (R/O)

One of the following codes:

- A field may not be "missing" and is allocated by the computer
- R field may not be "missing" (required).
- O field may be "missing" (optional).
- X field not stored in data base, allocated by computer when writing records into flat files and always equal to the record number.

4 RECORD CODE (Rec)

A 3-digit record code that is equal to the output record identifier of a single line record or the first line of a multiple line record. An asterisk (*) in this column indicates that second and subsequent data strings in transmission files start with data fields from column one.

5 FIELD NUMBER (#)

The number of the field within a record.

6 START COLUMN (Col.)

Column in which field starts.

7 FIELD TYPE (Type)

One of the following codes:

- N integer
- F floating point real number (with decimal point)
- D date (YYYYMMDD) - a special kind of integer
- T time (hhmm) - a special kind of integer
- C alpha-numeric code to be validated against a code list
- S string - no validation possible

8 FORMAT

Alphanumeric characters are indicated by the letter A, numeric characters by D and signed fields by the letter S. For fields longer than one character this letter may either be repeated or the number of repetitions may be indicated by a number preceding the respective letter. The position of the decimal point is shown where applicable.

9 MAXIMUM

Applicable to field types N and F only. Maximum value that this field may be. If the value of this parameter is equal to the maximum value possible then no value is given.

10 MINIMUM

Applicable to field types N and F only. Minimum value that this field may be. If the value of this parameter is equal to the minimum value possible then no value is given.

11 MISSING VALUE

In the case of optional fields, this value is stored on the database if the value is "missing". Not applicable to required items.

12 LINC INTERNAL NAME

Name by which this field is known within the LINC database. This name will appear alongside LINC-generated error messages when loading data.

000 BATCH

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	000	1	1	N	3D	000	000	-	
0.0. 1	Transaction code	R	000	2	4	C	3A			-	
0.0. 2	Batch number	R	000	3	7	N	6D			-	
0.0. 3	Description	R	000	4	13	S	30A			-	
0.0. 4	Number of records	R	000	5	43	N	4D		1	-	

1 SITE

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	001	1	1	N	3D	001	001	-	
1.0. 1	Map code	R	001	2	4	S	6A	3432DD	2216AA	-	SITE01
1.0. 2	Number on 1 : 50 000 map	A	001	3	10	N	5D			-	SITE02
1.0. 3	Reporting institution	R	001	4	15	C	4A			-	SITE03
1.0. 4	Date record entered	A	001	5	19	D	8D	21000000	19000000	-	SITE04
1.0. 5	Header sequence number	A	001	6	27	N	3D			-	SITE05
1.0. 6	Repeating group number	A	001	7	30	1N	3D			-	SITE06

10 ENTRY

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	010	1	1	N	3D	010	010	-	
1.0. 1	Site id code	A	010	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
1.0. 2	Map code	A	010	3	15	S	6A	3432DD	2216AA	-	ENTRY02
1.0. 3	Number on 1 : 50 000 map	A	010	4	21	N	5D			-	ENTRY03
1.0. 4	Province, district & farm no.	O	010	5	26	S	7A			blank	ENTRY04
1.0. 5	Site name	O	010	6	33	S	42A			blank	ENTRY05
1.0. 6	Topographic setting	O	*	1	1	C	1A			blank	ENTRY06
1.0. 7	Latitude	R	*	2	2	F	DD.5D	34.99999	22.00000	-	ENTRY07
1.0. 8	Longitude	R	*	3	10	F	DD.5D	32.99999	16.00000	-	ENTRY08
1.0. 9	Coordinate accuracy	R	*	4	18	C	1A	4	0	-	ENTRY09
1.0.10	Drainage region	R	*	5	19	S	4A			blank	ENTRY10
1.0.11	Altitude	O	*	6	23	F	SDDDD.DD	4000.	-4000.	9999.99	ENTRY11
1.0.12	Method of measurement	O	*	7	31	C	1A			blank	ENTRY12
1.0.13	Site type	R	*	8	32	C	1A			-	ENTRY13
1.0.14	Site selector	O	*	9	33	C	3A			blank	ENTRY14
1.0.15	Nominal diameter	O	*	10	36	N	4D			0	ENTRY15
1.0.16	Depth completed	O	*	11	40	F	3D.DD			0.	ENTRY16
1.0.17	Completion date	O	*	12	46	D	8D	21000000	19000000	0	ENTRY17
1.0.18	Depth information source	O	*	13	54	C	1A			blank	ENTRY18
1.0.19	Status of site	O	*	14	55	C	1A			blank	ENTRY19
1.0.20	Purpose of site	O	*	15	56	C	1A			blank	ENTRY20
1.0.21	Water use: consumer	O	*	16	57	C	1A			blank	ENTRY21
1.0.22	Water use: application	O	*	17	58	C	2A			blank	ENTRY22
1.0.23	Reporting institution	A	*	18	60	C	4A			-	ENTRY23
1.0.24	Equipment	O	*	19	64	C	1A			blank	ENTRY24
1.0.25	Potability	O	*	20	65	C	1A			blank	ENTRY25
1.0.26	Date record entered	A	*	1	1	D	8D	21000000	19000000	-	ENTRY26
1.0.27	Date record updated	A	*	2	9	D	8D	21000000	19000000	-	ENTRY27
1.0.28	Comment	O	*	3	17	1S	12A			blank	ENTRY28

20 LOGS

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	020	1	1	N	3D	020	020	-	
2.0. 1	Site id code	A	020	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
2.0. 2	Header sequence number	A	020	3	15	N	3D			-	LOGS02
2.0. 3	Reporting institution	A	020	4	18	C	4A			-	LOGS03
2.0. 4	Date of entry	A	020	5	22	D	8D	21000000	19000000	-	LOGS04

21 PENETRATION RATE

	Output record id number	X	021	1	1	N	3D	021	021	-	
2.1. 1	Site id code	A	021	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
2.1. 2	Header sequence number	A	021	3	15	N	3D			-	PENED02
2.1. 3	Repeating group number	A	021	4	18	N	3D			-	PENED03
2.1. 4	Depth to top of interval	R	021	5	21	F	3D.DD			-	PENED04
2.1. 5	Depth to bottom of interval	R	021	6	27	F	3D.DD			-	PENED05
2.1. 6	Diameter of interval	R	021	7	33	N	4D			-	PENED06
2.1. 7	Penetration rate	R	021	8	37	F	3D.DD			-	PENED07
2.1. 8	Comment	O	021	9	43	S	12A			blank	PENED08

22 AQUIFER

	Output record id number	X	022	1	1	N	3D	022	022	-	
2.2. 1	Site id code	A	022	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
2.2. 2	Header sequence number	A	022	3	15	N	3D			-	AQUID02
2.2. 3	Repeating group number	A	022	4	18	N	3D			-	AQUID03
2.2. 4	Depth to top of aquifer	R	022	5	21	F	3D.DD			-	AQUID04
2.2. 5	Depth to bottom of aquifer	O	022	6	27	F	3D.DD			0.	AQUID05
2.2. 6	Aquifer code	O	022	7	33	C	6A			blank	AQUID06
2.2. 7	Comment	O	022	8	39	S	12A			blank	AQUID07

20 LOGS (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
23 UNCONSOLIDATED											
	Output record id number	X	023	1	1	N	3D	023	023	-	
2.3. 1	Site id code	A	023	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
2.3. 2	Header sequence number	A	023	3	15	N	3D			-	UNCOD02
2.3. 3	Repeating group number	A	023	4	18	N	3D			-	UNCOD03
2.3. 4	Depth to top of interval	O	023	5	21	F	3D,DD				UNCOD04
2.3. 5	Lithology code	R	023	6	27	C	4A			-	UNCOD05
2.3. 6	Colour (primary)	O	023	7	31	C	1A			blank	UNCOD06
2.3. 7	Colour (secondary)	O	023	8	32	C	1A			blank	UNCOD07
2.3. 8	Texture	O	023	9	33	C	2A			blank	UNCOD08
2.3. 9	Feature (primary)	O	023	10	35	C	2A			blank	UNCOD9P
2.3.10	Feature (secondary)	O	023	11	37	C	2A			blank	UNCOD9S
2.3.11	Feature attribute	O	023	12	39	C	1A			blank	UNCOD9A
2.3.12	Sorting	O	023	13	40	C	2A			blank	UNCOD10
2.3.13	Roundness	O	023	14	42	C	2A			blank	UNCOD11
2.3.14	Sieve analysis (1)	O	023	11	44	N	2D			0	UNCOD12
2.3.15	Sieve analysis (2)	O	023	12	46	N	2D			0	UNCOD13
2.3.16	Sieve analysis (3)	O	023	13	48	N	2D			0	UNCOD14
2.3.17	Sieve analysis (4)	O	023	14	50	N	2D			0	UNCOD15
2.3.18	Sieve analysis (5)	O	023	15	52	N	2D			0	UNCOD16
2.3.19	Sieve analysis (6)	O	023	16	54	N	2D			0	UNCOD17
2.3.20	Sieve analysis (7)	O	023	17	56	N	2D			0	UNCOD18
2.3.21	Comment	O	023	18	58	S	12A			blank	UNCOD19

20 LOGS (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
24 CONSOLIDATED											
	Output record id number	X	024	1	1	N	3D	024	024	-	
2.3. 1	Site id code	A	024	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
2.3. 2	Header sequence number	A	024	3	15	N	3D			-	GEOLD02
2.3. 3	Repeating group number	A	024	4	18	N	3D			-	GEOLD03
2.3. 4	Depth to top of interval	O	024	5	21	F	3D.DD				GEOLD04
2.3. 5	Lithology code	R	024	6	27	C	4A			-	GEOLD05
2.3. 6	Colour (primary)	O	024	7	31	C	1A			blank	GEOLD06
2.3. 7	Colour (secondary)	O	024	8	32	C	1A			blank	GEOLD07
2.3. 8	Texture	O	024	9	33	C	2A			blank	GEOLD08
2.3. 9	Feature	O	024	10	35	C	2A			blank	GEOLD09
2.3.10	Comment	O	023	11	37	S	12A			blank	GEOLD17

30 CONSTRUCTION

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	030	1	1	N	3D	030	030	-	
3.0. 1	Site id code	A	030	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
3.0. 2	Header sequence number	A	030	3	15	N	3D			-	CONST02
3.0. 3	Piezometer number	O	030	4	18	N	1D			0	CONST03
3.0. 4	Reporting institution	A	030	5	19	C	4A			-	CONST04
3.0. 5	Date record entered	A	030	6	23	D	8D	21000000	19000000	-	CONST05
3.0. 6	Date of construction	R	030	7	31	D	8D	21000000	19000000	-	CONST06
3.0. 7	Name of contractor	O	030	8	39	S	24A			blank	CONST07
3.0. 8	Construction data source	O	030	9	63	C	1A			blank	CONST08
3.0. 9	Method of construction	O	*	1	1	C	1A			blank	CONST09
3.0.10	Type of finish	O	*	2	2	C	1A			blank	CONST10
3.0.11	Method of development	O	*	3	3	C	1A			blank	CONST11
3.0.12	Duration of development	O	*	4	4	N	2D			0	CONST12
3.0.13	Spec. development treatment	O	*	5	6	C	1A			blank	CONST13
3.0.14	Cost of construction	O	*	6	7	F	5D.DD			0.	CONST14
3.0.15	Comment	O	*	7	15	S	12A			blank	CONST15

31 HOLE

	Output record id number	X	031	1	1	N	3D	031	031	-	
3.1. 1	Site id code	A	031	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
3.1. 2	Header sequence number	A	031	3	15	N	3D			-	HOLED02
3.1. 3	Repeating group number	A	031	4	18	N	3D			-	HOLED03
3.1. 4	Depth to top of interval	O	031	5	21	F	3D.DD				HOLED04
3.1. 5	Depth to bottom of interval	R	031	6	27	F	3D.DD			-	HOLED05
3.1. 6	Diameter of hole	R	031	7	33	N	4D			-	HOLED06
3.1. 7	Comment	O	031	8	37	S	12A			blank	HOLED07

30 CONSTRUCTION (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
32 CASING											
	Output record id number	X	032	1	1	N	3D	032	032	-	
3.2. 1	Site id code	A	032	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
3.2. 2	Header sequence number	A	032	3	15	N	3D			-	CASED02
3.2. 3	Repeating group number	A	032	4	18	N	3D			-	CASED03
3.2. 4	Depth to top of interval	O	032	5	21	F	SDDD.DD				CASED04
3.2. 5	Depth to bottom of interval	R	032	6	28	F	3D.DD			-	CASED05
3.2. 6	Diameter of interval	R	032	7	34	N	4D			-	CASED06
3.2. 7	Casing material	O	032	8	38	C	1A			blank	CASED07
3.2. 8	Wall thickness of casing	O	032	9	39	F	DD.D			0.	CASED08
3.2. 9	Comment	O	032	10	43	S	12A			blank	CASED09

33 OPENINGS

	Output record id number	X	033	1	1	N	3D	33	033	-	
3.3. 1	Site id code	A	033	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
3.3. 2	Header sequence number	A	033	3	15	N	3D			-	OPEND02
3.3. 3	Repeating group number	A	033	4	18	N	3D			-	OPEND03
3.3. 4	Depth to top of interval	R	033	5	21	F	3D.DD			-	OPEND04
3.3. 5	Depth to bottom of interval	R	033	6	27	F	3D.DD			-	OPEND05
3.3. 6	Diameter of open interval	R	033	7	33	N	4D			-	OPEND06
3.3. 7	Material in this interval	O	033	8	37	C	11A			blank	OPEND07
3.3. 8	Type of openings	R	033	9	38	C	A			-	OPEND08
3.3. 9	Length of openings	O	033	10	39	N	3D			0	OPEND09
3.3.10	Width of openings	O	033	11	42	F	D.D			0.	OPEND10
3.3.11	Hor. dist. between openings	O	033	12	45	N	3D			0	OPEND11
3.3.12	Vert. dist. between openings	O	033	13	48	N	3D			0	OPEND12
3.3.13	Method openings made	O	033	14	51	C	1A			blank	OPEND13
3.3.14	Comment	O	033	15	52	S	12A			blank	OPEND14

30 CONSTRUCTION (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
34 FILL											
	Output record id number	X	034	1	1	N	3D	034	034	-	
3.4. 1	Site id code	A	034	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
3.4. 2	Header sequence number	A	034	3	15	N	3D			-	FILLD02
3.4. 3	Repeating group number	A	034	4	18	N	3D			-	FILLD03
3.4. 4	Depth to top of interval	O	034	5	21	F	3D.DD			-	FILLD04
3.4. 5	Depth to bottom of interval	R	034	6	27	F	3D.DD			-	FILLD05
3.4. 6	Diameter of open interval	R	034	7	33	C	1A			-	FILLD06
3.4. 7	Comment	O	034	8	34	S	12A			blank	FILLD07

40 INSTALLATION

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	040	1	1	N	3D	040	040	-	
4.0. 1	Site id code	A	040	2	4	S	11A	3432DD99999	22 16AA00001	-	ENTRY01
4.0. 2	Header sequence number	A	040	3	15	N	3D			-	INSTL02
4.0. 3	Reporting institution	A	040	4	18	C	4A			-	INSTL03
4.0. 4	Date record entered	A	040	5	22	D	8D	21000000	19000000	-	INSTL04
4.0. 5	Date of installation	R	040	6	30	D	8D	21000000	19000000	-	INSTL05
4.0. 6	Type of installation	R	040	7	38	C	1A			-	INSTL06
4.0. 7	Depth to pump intake	O	040	8	39	F	3D.DD			0.	INSTL07
4.0. 8	Type of power	O	040	9	45	C	1A			blank	INSTL08
4.0. 9	Power rating	O	040	10	46	N	4D			0	INSTL09
4.0.10	Manufacturer	O	040	11	50	S	18A			blank	INSTL10
4.0.11	Serial number	O	*	1	1	S	12A			blank	INSTL11
4.0.12	Power meter number	O	*	2	13	S	12A			blank	INSTL12
4.0.13	Monitoring facility	O	*	3	25	C	1A			blank	INSTL13
4.0.14	Installation data source	O	*	4	26	C	1A			blank	INSTL14
4.0.15	Comment	O	*	5	27	S	12A			blank	INSTL15

50 DISCHARGE RATE

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	050	1	1	N	3D	050	050	-	
5.0.1	Site id code	A	050	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
5.0.2	Header sequence number	A	050	3	15	N	3D			-	DISCH02
5.0.3	Reporting institution	A	050	4	18	C	4A			-	DISCH03
5.0.4	Date record entered	A	050	5	22	D	8D	21000000	19000000	-	DISCH04
5.0.5	Type of discharge	R	050	6	30	C	1A			-	DISCH05
5.0.6	Method discharge measured	O	050	7	31	C	1A			blank	DISCH06
5.0.7	Discharge information source	O	050	8	32	C	1A			blank	DISCH07

51 DISCHARGE RATE

	Output record id number	X	051	1	1	N	3D	051	051	-	
5.1.1	Site id code	A	051	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
5.1.2	Header sequence number	A	051	3	15	N	3D			-	DISCD02
5.1.3	Repeating group number	A	051	4	18	N	3D			-	DISCD03
5.1.4	Date of measurement	R	051	5	21	D	8D	21000000	19000000	-	DISCD04
5.1.5	Time of measurement	O	051	6	29	T	4D	2359	0	2400	DISCD05
5.1.6	Discharge rate	R	051	7	33	F	SDDD.DD			-	DISCD06
5.1.7	Comment	O	051	8	40	S	12A			blank	DISCD07

60 WATER-LEVEL

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	060	1	1	N	3D	060	060	-	
6.0. 1	Site id code	A	060	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
6.0. 2	Header sequence number	A	060	3	15	N	3D			-	LEVEL02
6.0. 3	Piezometer number	O	060	4	18	N	1D			0	LEVEL03
6.0. 4	Reporting institution	A	060	5	19	C	4A			-	LEVEL04
6.0. 5	Date record entered	A	060	6	23	D	8D	21000000	19000000	-	LEVEL05
6.0. 6	Method of measurement	O	060	7	31	C	1A			blank	LEVEL06
6.0. 7	Water-level status	O	060	8	32	C	1A			blank	LEVEL07
6.0. 8	Collar elevation	O	060	9	33	F	SDD.DD			99.99	LEVEL08
6.0. 9	Water-level info. source	O	060	10	39	C	1A			blank	LEVEL09

61 WATER-LEVEL

	Output record id number	X	061	1	1	N	3D	061	061	-	
6.1. 1	Site id code	A	061	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
6.1. 2	Header sequence number	A	061	3	15	N	3D			-	LEVED02
6.1. 3	Repeating group number	A	061	4	18	N	3D			-	LEVED03
6.1. 4	Date of measurement	R	061	5	21	D	8D	21000000	19000000	-	LEVED04
6.1. 5	Time of measurement	O	061	6	29	T	4D	2359	0	2400	LEVED05
6.1. 6	Water-level	R	061	7	33	F	SDDD.DD			-	LEVED06
6.1. 7	Comment	O	061	8	40	F	12A			blank	LEVED07

60 WATER-LEVEL (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
62 LEVELS FROM DIGITIZER											
	Output record id number	X	062	1	1	N	3D	062	062	-	
6.2. 1	Site id code	A	062	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
6.2. 2	Date of measurement	R	062	3	15	D	8D	21000000	19000000	-	LEVEA02
6.2. 3	Time of measurement	O	062	4		T	4D	2359	0	2400	LEVEA03
6.2. 4	Water-level	R	062	5		F	SDDD.DD			-	LEVEA04
6.2. 5	Date of measurement	R	062	6	15	D	8D	21000000	19000000	-	LEVEA05
6.2. 6	Time of measurement	O	062	7		T	4D	2359	0	2400	LEVEA06
6.2. 7	Water-level	R	062	8		F	SDDD.DD			-	LEVEA07
6.2. 8	Date of measurement	R	062	9	15	D	8D	21000000	19000000	-	LEVEA08
6.2. 9	Time of measurement	O	062	10		T	4D	2359	0	2400	LEVEA09
6.2.10	Water-level	R	062	11		F	SDDD.DD			-	LEVEA10
6.2.11	Date of measurement	R	062	12	15	D	8D	21000000	19000000	-	LEVEA11
6.2.12	Time of measurement	O	062	13		T	4D	2359	0	2400	LEVEA12
6.2.13	Water-level	R	062	14		F	SDDD.DD			-	LEVEA13
6.2.14	Date of measurement	R	062	15	15	D	8D	21000000	19000000	-	LEVEA14
6.2.15	Time of measurement	O	062	16		T	4D	2359	0	2400	LEVEA15
6.2.16	Water-level	R	062	17		F	SDDD.DD			-	LEVEA16
6.2.17	Date of measurement	R	062	18	15	D	8D	21000000	19000000	-	LEVEA11
6.2.18	Time of measurement	O	062	19		T	4D	2359	0	2400	LEVEA12
6.2.19	Water-level	R	062	20		F	SDDD.DD			-	LEVEA13
6.2.20	Date of measurement	R	062	21	15	D	8D	21000000	19000000	-	LEVEA14
6.2.21	Time of measurement	O	062	22		T	4D	2359	0	2400	LEVEA15
6.2.22	Water-level	R	062	23		F	SDDD.DD			-	LEVEA10
6.2.23	Date of measurement	R	062	24	15	D	8D	21000000	19000000	-	LEVEA11
6.2.24	Time of measurement	O	062	25		T	4D	2359	0	2400	LEVEA12
6.2.25	Water-level	R	062	26		F	SDDD.DD			-	LEVEA13
6.2.26	Date of measurement	R	062	27	15	D	8D	21000000	19000000	-	LEVEA14

60 WATER-LEVEL (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
6.2.27	Time of measurement	O	062	28		T	4D	2359	0	2400	LEVEA15
6.2.28	Water-level	R	062	29		F	SDDD.DD			-	LEVEA16
6.2.29	Date of measurement	R	062	30	15	D	8D	21000000	19000000	-	LEVEA11
6.2.30	Time of measurement	O	062	31		T	4D	2359	0	2400	LEVEA12
6.2.31	Water-level	R	062	32		F	SDDD.DD			-	LEVEA13
6.2.32	Date of measurement	R	062	33	15	D	8D	21000000	19000000	-	LEVEA14
6.2.33	Time of measurement	O	062	34		T	4D	2359	0	2400	LEVEA15
6.2.34	Water-level	R	062	35		F	SDDD.DD			-	LEVEA10
6.2.35	Date of measurement	R	062	36	15	D	8D	21000000	19000000	-	LEVEA11
6.2.36	Time of measurement	O	062	37		T	4D	2359	0	2400	LEVEA12
6.2.37	Water-level	R	062	38		F	SDDD.DD			-	LEVEA13

70 WATER SAMPLE

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	070	1	1	N	3D	070	070	-	
7.0.1	Site id code	A	070	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
7.0.2	Header sequence number	A	070	3	15	N	3D			-	SAMPL02
7.0.3	Reporting institution	A	070	4	18	C	4A			-	SAMPL03
7.0.4	Date record entered	A	070	5	22	D	8D	21000000	19000000	-	SAMPL04

71 WATER-SAMPLE

	Output record id number	X	071	1	1	N	3D	071	071	-	
7.1.1	Site id code	A	071	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
7.1.2	Header sequence number	A	071	3	15	N	3D			-	SAMPD02
7.1.3	Repeating group number	A	071	4	18	N	3D			-	SAMPD03
7.1.4	Date of sampling	R	071	5	21	D	8D	21000000	19000000	-	SAMPD04
7.1.5	Time of sampling	O	071	6	29	T	4D	2359	0	2400	SAMPD05
7.1.6	Sample number	R	071	7	33	S	8D			-	SAMPD06
7.1.7	Comment	O	071	8	41	S	12A			blank	SAMPD07

80 FIELD MEASUREMENT

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	080	1	1	N	3D	080	080	-	
8.0. 1	Site id code	A	080	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
8.0. 2	Header sequence number	A	080	3	15	N	3D			-	FIELM02
8.0. 3	Reporting institution	A	080	4	18	C	4A			-	FIELM03
8.0. 4	Date record entered	A	080	5	22	D	8D	21000000	19000000	-	FIELM04

81 FIELD MEASUREMENT

	Output record id number	X	081	1	1	N	3D	081	081	-	
8.1. 1	Site id code	A	081	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
8.1. 2	Header sequence number	A	081	3	15	N	3D			-	FIEDD02
8.1. 3	Repeating group number	A	081	4	18	N	3D			-	FIEDD03
8.1. 4	Parameter measured	R	081	5	21	C	1A			-	FIEDD08
8.1. 5	Date of measurement	R	081	6	22	D	8D	21000000	19000000	-	FIEDD04
8.1. 6	Time of measurement	O	081	7	30	T	4D	2359	0	2400	FIEDD05
8.1. 7	Depth to top of interval	R	081	8	36	F	3D.DD			-	FIEDD09
8.1. 7	Depth to bottom of interval	O	081	9	42	F	3D.DD			0.	FIEDD10
8.1. 8	Reading	R	081	10	48	F	4D.D			-	FIEDD06
8.1. 9	Comment	O	081	11	54	S	12A			blank	FIEDD07

80 FIELD MEASUREMENT (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
82 FIELD MEASUREMENT FROM AUTOMATIC RECORDER											
	Output record id number	X	082	1	1	N	3D	082	082	-	
8.2.1	Site id code	A	082	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
8.2.2	Date of measurement	R	082	3	15	D	8D	21000000	19000000	-	FIELA02
8.2.3	Time of measurement	O	082	4		T	4D	2359	0	2400	FIELA03
8.2.4	Parameter measured	R	082	5		C	1A			-	FIELA04
8.2.5	Reading	R	082	6		F	4D.D			-	FIELA05
8.1.6	Depth of measurement	R	082	7		F	3D.DD			0.00	FIELA06
8.2.7	Date of measurement	R	082	8	15	D	8D	21000000	19000000	-	FIELA07
8.2.8	Time of measurement	O	082	9		T	4D	2359	0	2400	FIELA08
8.2.9	Parameter measured	R	082	10		C	1A			-	FIELA09
8.2.10	Reading	R	082	11		F	4D.D			-	FIELA10
8.1.11	Depth of measurement	R	082	12		F	3D.DD			0.00	FIELA11
8.2.12	Date of measurement	R	082	13	15	D	8D	21000000	19000000	-	FIELA12
8.2.13	Time of measurement	O	082	14		T	4D	2359	0	2400	FIELA33
8.2.14	Parameter measured	R	082	15		C	1A			-	FIELA14
8.2.15	Reading	R	082	16		F	4D.D			-	FIELA15
8.1.16	Depth of measurement	R	082	17		F	3D.DD			0.00	FIELA16
8.2.17	Date of measurement	R	082	18	15	D	8D	21000000	19000000	-	FIELA17
8.2.18	Time of measurement	O	082	19		T	4D	2359	0	2400	FIELA18
8.2.19	Parameter measured	R	082	20		C	1A			-	FIELA19
8.2.10	Reading	R	082	21		F	4D.D			-	FIELA20
8.1.21	Depth of measurement	R	082	22		F	3D.DD			0.00	FIELA21
8.2.22	Date of measurement	R	082	23	15	D	8D	21000000	19000000	-	FIELA22
8.2.23	Time of measurement	O	082	24		T	4D	2359	0	2400	FIELA23
8.2.24	Parameter measured	R	082	25		C	1A			-	FIELA24
8.2.25	Reading	R	082	26		F	4D.D			-	FIELA25
8.1.26	Depth of measurement	R	082	27		F	3D.DD			0.00	FIELA26

80 FIELD MEASUREMENT (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
8.2.27	Date of measurement	R	082	28	15	D	8D	21000000	19000000	-	FIELA27
8.2.28	Time of measurement	O	082	29		T	4D	2359	0	2400	FIELA28
8.2.29	Parameter measured	R	082	30		C	1A			-	FIELA29
8.2.30	Reading	R	082	31		F	4D.D			-	FIELA30
8.1.31	Depth of measurement	R	082	32		F	3D.DD			0.00	FIELA31
8.2.32	Date of measurement	R	082	33	15	D	8D	21000000	19000000	-	FIELA32
8.2.33	Time of measurement	O	082	34		T	4D	2359	0	2400	FIELA33
8.2.34	Parameter measured	R	082	35		C	1A			-	FIELA34
8.2.35	Reading	R	082	36		F	4D.D			-	FIELA35
8.1.36	Depth of measurement	R	082	37		F	3D.DD			0.00	FIELA36
8.2.37	Date of measurement	R	082	38	15	D	8D	21000000	19000000	-	FIELA37
8.2.38	Time of measurement	O	082	39		T	4D	2359	0	2400	FIELA38
8.2.39	Parameter measured	R	082	40		C	1A			-	FIELA39
8.2.40	Reading	R	082	41		F	4D.D			-	FIELA40
8.1.41	Depth of measurement	R	082	42		F	3D.DD			0.00	FIELA41
8.2.42	Date of measurement	R	082	43	15	D	8D	21000000	19000000	-	FIELA42
8.2.43	Time of measurement	O	082	44		T	4D	2359	0	2400	FIELA43
8.2.44	Parameter measured	R	082	45		C	1A			-	FIELA44
8.2.45	Reading	R	082	46		F	4D.D			-	FIELA45
8.1.46	Depth of measurement	R	082	47		F	3D.DD			0.00	FIELA46
8.2.47	Date of measurement	R	082	48	15	D	8D	21000000	19000000	-	FIELA47
8.2.48	Time of measurement	O	082	49		T	4D	2359	0	2400	FIELA48
8.2.49	Parameter measured	R	082	50		C	1A			-	FIELA49
8.2.50	Reading	R	082	51		F	4D.D			-	FIELA50
8.1.51	Depth of measurement	R	082	52		F	3D.DD			0.00	FIELA51

80 FIELD MEASUREMENT (cont.)

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
8.2.52	Date of measurement	R	082	53	15	D	8D	21000000	19000000	-	FIELA52
8.2.53	Time of measurement	O	082	54		T	4D	2359	0	2400	FIELA53
8.2.54	Parameter measured	R	082	55		C	1A			-	FIELA54
8.2.55	Reading	R	082	56		F	4D.D			-	FIELA55
8.1.56	Depth of measurement	R	082	57		F	3D.DD			0.00	FIELA56
8.2.57	Date of measurement	R	082	58	15	D	8D	21000000	19000000	-	FIELA57
8.2.58	Time of measurement	O	082	59		T	4D	2359	0	2400	FIELA58
8.2.59	Parameter measured	R	082	60		C	1A			-	FIELA59
8.2.60	Reading	R	082	61		F	4D.D			-	FIELA60
8.1.61	Depth of measurement	R	082	62		F	3D.DD			0.00	FIELA61

90 METER READING

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	090	1	1	N	3D	090	090	-	
9.0. 1	Site id code	A	090	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
9.0. 2	Header sequence number	A	090	3	15	N	3D			-	METER02
9.0. 3	Reporting institution	A	090	4	18	C	4A			-	METER03
9.0. 4	Date record entered	A	090	5	22	D	8D	21000000	19000000	-	METER04
9.0. 5	Type of meter read	R	090	6	30	C	A			-	METER05
9.0. 6	Comment	O	090	7	31	S	12A			blank	METER06

91 METER READING

	Output record id number	X	091	1	1	N	3D	091	091	-	
9.1. 1	Site id code	A	091	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
9.1. 2	Header sequence number	A	091	3	15	N	3D			-	METED02
9.1. 3	Repeating group number	A	091	4	18	N	3D			-	METED03
9.1. 4	Date of reading	R	091	5	21	D	8D	21000000	19000000	-	METED04
9.1. 5	Time of reading	O	091	6	29	T	4D	2359	0	2400	METED05
9.1. 6	Reading	R	091	7	33	F	8D.DD			-	METED06
9.1. 7	Comment	O	091	8	44	S	12A			blank	METED07

100 PUMPING TEST

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	100	1	1	N	3D	100	100	-	
10.0. 1	Site id code	A	100	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
10.0. 2	Header sequence number	A	100	3	15	N	3D			-	PUMPT02
10.0. 3	Reporting institution	A	100	4	18	C	4A			-	PUMPT03
10.0. 4	Date record entered	A	100	5	22	D	8D	21000000	19000000	-	PUMPT04
10.0. 5	Date pumping test started	A	100	6	30	D	8D			-	PUMPT05
10.0. 6	Method tested	R	100	7	38	C	A			-	PUMPT06
10.0. 7	Depth to pump intake	O	100	8	39	F	3D.DD			0.	PUMPT07
10.0. 8	Rec. abstraction rate	O	100	9	45	F	3D.D			0.	PUMPT08
10.0. 9	Transmissivity	O	100	10	50	N	3D			0	PUMPT09
10.0.10	Storativity	O	100	11	53	N	3D			0	PUMPT10
10.0.11	Comment	O	100	12	56	S	12A			blank	PUMPT11

110 MISCELLANEOUS

Item number	Description	R/O	Rec	#	Col.	Type	Format	Maximum value	Minimum value	Missing value	LINC name
	Output record id number	X	110	1	1	N	3D	110	110	-	
11.0. 1	Site id code	A	110	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
11.0. 2	Header sequence number	A	110	3	15	N	3D			-	MISCL02
11.0. 3	Reporting institution	A	110	4	18	C	4A			-	MISCL03
11.0. 4	Date record entered	A	110	5	22	D	8D	21000000	19000000	-	MISCL04

111 SITE SELECTION

	Output record id number	X	111	1	1	N	3D	111	111	-	
11.1. 1	Site id code	A	111	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
11.1. 2	Header sequence number	A	111	3	15	N	3D			-	STESD02
11.1. 3	Repeating group number	A	111	4	18	N	3D			-	STESD03
11.2. 4	Description & recomm.	R	*	1	1	S	60A			-	STESD04

112 NAME OF OWNER

	Output record id number	X	112	1	1	N	3D	112	112	-	
11.2. 1	Site id code	A	112	2	4	S	11A	3432DD99999	2216AA00001	-	ENTRY01
11.2. 2	Header sequence number	A	112	3	15	N	3D			-	OWNRD02
11.2. 3	Repeating group number	A	112	4	18	N	3D			-	OWNRD03
11.2. 4	Ownership date	O	112	5	21	D	8D	21000000	19000000	0	OWNRD04
11.2. 5	Name of owner	R	*	1	1	S	60A			-	OWNRD05

110 MISCELLANEOUS (cont.)

Item number	Description					Format	Maximum value	Minimum value	Missing value	LINC name
113 OTHER IDENTIFIER										
	Output record id number	X	113	1	1	N	3D	113	113	-
11.3. 1	Site id code	A	113	2	4	S	11A	3432DD99999	2216AA00001	- ENTRY01
11.3. 2	Header sequence number	A	113	3	15	N	3D			- OTHID02
11.3. 3	Repeating group number	A	113	4	18	N	3D			- OTHID03
11.3. 4	Other identifier	R	113	5	21	S	12A			- OTHID04
11.3. 5	Assignor	O	113	6	33	S	42A			blank OTHID05
114 OTHER DATA										
	Output record id number	X	114	1	1	N	3D	114	114	-
11.4. 1	Site id code	A	114	2	4	S	11A	3432DD99999	2216AA0000	- ENTRY01
11.4. 2	Header sequence number	A	114	3	15	N	3D			- OTHDD02
11.4. 3	Repeating group number	A	114	4	18	N	3D			- OTHDD03
11.4. 4	Data type	R	114	5	21	C	A			- OTHDD04
11.4. 5	Type of logger	O	114	6	22	S	12A			blank OTHDD05
11.4. 6	Location	R	114	7	34	S	42A			- OTHDD06
11.4. 7	Format	O	114	8	76	C	A			blank OTHDD07

110 MISCELLANEOUS (cont.)

Item number	Description					Format	Maximum value	Minimum value	Missing value	LINC name
115 SITE VISITS										
	Output record id number	X	115	1	1	N	3D	115	115	-
11.5. 1	Site id code	A	115	2	4	S	11A	3432DD99999	2216AA0000	- ENTRYY01
11.5. 2	Header sequence number	A	115	3	15	N	3D			- STEVD02
11.5. 3	Repeating group number	A	115	4	18	N	3D			- STEVD03
11.5. 4	Date of visit	R	115	5	21	D	8D	21000000	19000000	- STEVD04
11.5. 5	Visitor	R	115	6	29	S	42A			- STEVD05
116 SPECIAL CASES										
	Output record id number	X	116	1	1	N	3D	116	116	-
11.6. 1	Site id code	X	116	2	4	N	11A	3432DD99999	2216AA0000	- ENTRYY01
11.6. 2	Header sequence number	X	116	3	15	N	3D			- SPECD02
11.6. 3	Repeating group number	X	116	4	18	N	3D			- SPECD03
11.6. 4	Number of holes etc. in group	R	116	5	21	N	DD			- SPECD04
11.6. 5	Depth of the deepest hole	O	116	6	23	F	DDD.DD			- SPECD05
11.6. 6	Depth of shallowest hole	O	116	7	29	F	DDD.DD		0.	SPECD06
11.6. 7	Method of holes constructed	O	116	8	35	C	A		blank	SPECD07
11.6. 8	Diameter of group	O	116	9	36	F	DDDD.DD		0.	SPECD08
11.6. 9	Length of pon, tunnel or drain	O	116	10	43	F	DDD.DD		-	SPECD09
11.6.10	Strike of pond, tunnel or drain	O	116	11	49	N	3D	359	0	999 SPECD10
11.6.11	Dip of tunnel or drain	O	116	12	52	N	SDD	+90	-90	99 SPECD11
11.6.12	Depth of lateral collector	O	116	13	55	F	DDD.DD		0.	SPECD12
11.6.13	Length of lateral collector	O	116	14	61	F	DD.DD		0.	SPECD13
11.6.13	Mesh of screen in lateral	O	116	15	66	N	3D		0	SPECD14

110 MISCELLANEOUS (cont.)

Item number	Description					Format	Maximum value	Minimum value	Missing value	LINC name
117 REFERENCES										
	Output record id number	X	117	1	1	N	3D	117	117	-
11.7. 1	Site id code	A	117	2	4	S	11A	3432DD99999	2216AA0000	- ENTRYY01
11.7. 2	Header sequence number	A	117	3	15	N	3D			- REFSD02
11.7. 3	Repeating group number	A	117	4	18	N	3D			- REFSD03
11.7. 4	Reference	R	*	1	1	S	60A			- REFSD04
118 SEARCH STATUS										
	Output record id number	X	118	1	1	N	3D	118	118	-
11.8. 1	Site id code	A	118	2	4	S	11A	3432DD99999	2216AA0000	- ENTRYY01
11.8. 2	Header sequence number	A	118	3	15	N	3D			- SEARD02
11.8. 3	Repeating group number	A	118	4	18	N	3D			- SEARD03
11.8. 4	Record type & search period	R	118	5	21	S	42A			- SEARD04
119 COMMENTS										
	Output record id number	X	119	1	1	N	3D	119	119	-
11.9. 1	Site id code	A	119	2	4	N	11A	3432DD99999	2216AA0000	- ENTRYY01
11.9. 2	Header sequence number	A	119	3	15	N	3D			- COMMD02
11.9. 3	Repeating group number	A	119	4	18	N	3D			- COMMD03
11.9. 4	Comments	R	*	1	1	S	60A			- COMMD04

110 MISCELLANEOUS (cont.)

Item number	Description				Format	Maximum value	Minimum value	Missing value	LINC name
113 OTHER IDENTIFIER									
	Output record id number	X	113	1	1	N	3D	113	
11.3. 1	Site id code	A	113	2	4	S	11A	3432DD99999	2216AA00001
11.3. 2	Header sequence number	A	113	3	15	N	3D	-	ENTRY01
11.3. 3	Repeating group number	A	113	4	18	N	3D	-	OTHID02
11.3. 4	Other identifier	R	113	5	21	S	12A	-	OTHID03
11.3. 5	Assignor	O	113	6	33	S	42A	-	OTHID04
								blank	OTHID05

114 OTHER DATA

	Output record id number	X	114	1	1	N	3D	114	
11.4. 1	Site id code	A	114	2	4	S	11A	3432DD99999	2216AA0000
11.4. 2	Header sequence number	A	114	3	15	N	3D	-	ENTRY01
11.4. 3	Repeating group number	A	114	4	18	N	3D	-	OTHDD02
11.4. 4	Data type	R	114	5	21	C	A	-	OTHDD03
11.4. 5	Type of logger	O	114	6	22	S	12A	-	OTHDD04
11.4. 6	Location	R	114	7	34	S	42A	blank	OTHDD05
11.4. 7	Format	O	114	8	76	C	A	-	OTHDD06
								blank	OTHDD07

115 SITE VISITS

	Output record id number	X	115	1	1	N	3D	115	
11.5. 1	Site id code	A	115	2	4	S	11A	3432DD99999	2216AA0000
11.5. 2	Header sequence number	A	115	3	15	N	3D	-	ENTRY01
11.5. 3	Repeating group number	A	115	4	18	N	3D	-	STEVD02
								-	STEVD03

3 FUNCTIONAL DECOMPOSITION

(Components in alphabetical sequence)

AQUID - Aquifer Repeating group

1. Valid ENTRY must exist.
2. LOGS Header must exist.
3. Aquifer code must be in XAQUI Table.
4. If Depth to bottom is given then it must be $>$ Depth to top of interval.
5. Depth to top must $\neq$ zero.
6. Depth to top of interval must be $\geq$ Depth completed stored in ENTRY unless Depth completed = 0.

BEGIN - LOG-ON SCREEN

1. Identification must exist in XSECU.
2. Password must match that attached to Identification in XSECU.
3. Identification expiry date in XSECU must not be exceeded by current date.

CASED - Casing Repeating group

1. Valid ENTRY must exist.
2. CONST Header must exist.
3. Casing material code must be in XCODE Table (17).
4. Depth to bottom must $\neq$ zero.
5. Diameter of casing must $\neq$ zero.
6. A Hole Repeating group must exist. If it does not, return to the main menu.
7. Depth to top of interval must be $\geq$ Depth to bottom stored previously in ENTRY unless this is Repeating group 1 or unless the diameter of the interval differs from the diameter previously stored in ENTRY.
8. Diameter of interval may not increase with increasing depth.
9. Depth to bottom of interval must be $\leq$ Depth to bottom of Hole stored in ENTRY.
10. Depth top and bottom of most recent interval are stored in ENTRY as well as being stored here.
11. Diameter of most recent interval is stored in ENTRY as well as being stored here.

COMMD - Comments Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.

CONST - Construction Header

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).
3. Date constructed must be valid date (see below for further functional decomposition of valid date on page 10).
4. Data source code must be in XCODE Table (5).
5. Construction method code must be in XCODE Table (13).
6. Type finish code must be in XCODE Table (14).
7. Method development code must be in XCODE Table (15).
8. Special treatment code must be in XCODE Table (16).
9. Date constructed must $\neq$ zero.
10. If Date constructed is $>$ Date completed (in ENTRY) then Date completed is changed to equal Date constructed.

DISCD - Discharge rate Repeating group

1. Valid ENTRY must exist.
2. DISCH Header must exist.
3. Date measured must be a valid date.
4. Time measured must be a valid time.
5. Date measured must $\neq$ zero.
6. Discharge rate must $\neq$ zero.
7. Date measured must be after Date completed.

DISCH - DISCHARGE RATE HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).
3. Information source code must be in XCODE Table (5).
4. Type discharge code must be in XCODE Table (23).
5. Method discharge code must be in XCODE Table (24).
6. Date measured must be a valid date.

ENTRY - ENTRY DATA

1. Latitude must be valid (see page 10).
2. Longitude must be valid (see page 11).
3. Map code must be valid and within quarter-degree square of latitude/longitude of site.
4. Completion date must be valid.
5. Topographic setting code must be in XCODE Table (1).
6. Coordinate accuracy code must be in XCODE Table (32).
7. Method measurement code must be in XCODE Table (2).
8. If Altitude is not "missing" then Method measurement code may not be blank.
If Altitude is "missing" then Method of measurement code must be blank.
9. Altitude must be "missing" or valid.
10. Site type code must be in XCODE Table (3).
11. Depth information source code must be in XCODE Table (5).
12. Status code must be in XCODE Table (6).

13. Purpose code must be in XCODE Table (7).
14. Consumer code must be in XCODE Table (8).
15. Equipment code must be in XCODE Table (11).
16. Potability code must be in XCODE Table (12)).
17. Site selector code must be in XCODE Table (4).
18. Application code must be in XCODE Table (9).
19. Reporting institution code must be in XCODE Table (10).
20. District code must be in XDIST.
21. Map code may not be blank.
22. Number on map must $\neq$ zero.
23. (See also page 9 for the SITE screen which prepares data for this screen).
24. Drainage region code may not be blank.
25. The following values must be maintained on the ENTRY record:
 - Bottom of deepest interval - Penetration rate
 - Bottom of deepest interval - Aquifer
 - Top of deepest interval - Geology
 - Bottom of deepest interval - Hole
 - Bottom of deepest interval - Casing
 - Bottom of deepest interval - Openings
 - Bottom of deepest interval - Fill
 - Diameter of deepest Hole

FIEDD - Field measurement Repeating group

1. Valid ENTRY must exist.
2. FIELM Header must exist.
3. Date measured must $\neq$ zero.
4. Date measured must be valid date.
5. Parameter measured code must be in XCODE Table (27).
6. Time measured must be a valid time.
7. Reading must $\neq$ zero.

FIELM - Field measurement (automatic)

1. Valid ENTRY must exist.
2. On ADD transaction, record with key (ENTRY01, FIELA02 and FIELA03) must not exist before.
3. On CHG/INQ/DEL transaction, record with key (ENTRY01, FIELA02 and FIELA03) must exist.
4. Date measured must be valid date or = "0".
5. FIELA02 may not be "0".
6. Time measured must be a valid time, i.e. minutes from 0 to 59 and hours from 0 to 24.
7. RECORDER VALUES must be rounded up to 2 decimals.

FIELM - FIELD MEASUREMENT HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).

FILLD - Fill Repeating group

1. Valid ENTRY must exist.
2. CONST Header must exist.
3. Type of fill code must be in XCODE Table (20).
4. Depth to bottom must be $>$ Depth to top of interval.
5. Depth to bottom of interval is required.
6. If Type of fill code = X (Bottom closed) then Depth to bottom is not required.
7. An Openings Repeating group must exist. If it does not, return to the main menu.
8. Depth to top of interval must be $\leq$ Depth to bottom, stored previously in ENTRY unless this is Repeating group 1 or unless Type of fill code = x.
9. Depth to bottom of interval must be $\leq$ Depth to bottom of Hole stored in ENTRY.
10. Depth to top and bottom of most recent interval are stored in ENTRY as well as being stored here.

GEOLD - Consolidated Repeating group

1. Valid ENTRY must exist.
2. LOGS Header must exist.
3. Depth to top of interval must be $\leq$ Depth completed stored in ENTRY unless Depth completed = 0.
4. Lithology code must be in XLITH Table.
5. Primary colour code must be in XCODE (33).
6. Secondary colour code must be in XCODE (34).
7. If Secondary colour code is not blank then Primary colour code may not be blank.
8. If Primary colour code (black) then Secondary colour code must be blank.
9. If Primary colour code (white) then Secondary colour code must be blank.
10. Texture code must be in XCODE Table (35).
11. Feature code must be in XCODE Table (36).

HOLED- Hole Repeating group

1. Valid ENTRY must exist.
2. CONST Header must exist.
3. Depth to top may not = 0 unless the Repeating group number = 1.
4. Depth to bottom must be $>$ Depth to top of interval.
5. Diameter must be $>$ zero.
6. If Date of construction for the Header of this Repeating group is $>$ Date of construction in ENTRY then the new Date of construction is stored in ENTRY, Depth to bottom is stored in Depth completed of ENTRY and "C" in Depth information source.
7. If the Date of construction for the Header of this Repeating group = Date of construction in ENTRY and Depth to bottom is $>$ then Depth completed in ENTRY then Depth to bottom is stored in Depth completed of ENTRY and "C" in Depth information source.

8. If Transaction code = CHG and the value previously stored in Depth to bottom = Depth completed in ENTRY then Depth completed in Entry is also changed and "C" is stored in Depth information source.
9. If Transaction code = DEL and if Depth to bottom = Depth completed in ENTRY then 0.00 is stored in Depth completed and the Depth information source is changed to " ".
10. Diameter of hole may not increase with increasing depth.
11. Depth to top and bottom of most recent interval are stored in ENTRY as well as being stored here.

INSTL - INSTALLATION HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).
3. Type installation code must be in XCODE Table (11).
4. Type power code must be in XCODE Table (21).
5. Monitoring facility code must be in XCODE Table (22).
6. Data source code must be in XCODE Table (5).
7. Date installed must be a valid date.
7. Water-level must be $\leq$ Depth to bottom of Hole stored in ENTRY.
8. Date measured must be after Date completed.

LEVED - Water-level Repeating group

1. Valid ENTRY must exist.
2. LEVEL Header must exist.
3. Date measured must be a valid date.
4. Date measured must be $>$ zero.
5. Time without date not allowed.
6. Time must be valid.
7. Water-level must be $\leq$ Depth completed in ENTRY unless Depth completed = zero.

LEVEA - Water level (automatic)

1. Valid ENTRY must exist.
2. On ADD transaction, record with key (ENTRY01, LEVEA02 and LEVEA03) must not exist before.
3. On CHG/INQ/DEL transaction, record with key (ENTRY01, LEVEA02 and LEVEA03) must exist.
4. Date measured must be valid date or = "0".
5. LEVEA02 may not be "0".
6. Time measured must be a valid time, i.e. minutes from 0 to 59 and hours from 0 to 24.
7. Water levels must be rounded up to 2 decimals.

LEVEL - WATER-LEVEL HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).

3. Information source code must be in XCODE Table (5).
4. Method measurement code must be in XCODE Table (25).
5. Status code must be in XCODE Table (26).

LOGS - LOGS HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).
3. Date of log must $\neq$ zero.
4. Date of log must be valid date.

METED - Meter reading Repeating group

1. Valid ENTRY must exist.
2. METER Header must exist.
3. Date measured must $\neq$ zero.
4. Date measured must be a valid date.
5. Time must be a valid time.
6. Meter reading must $\neq$ zero.

METER - METER READING HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).
3. Meter type code must be in XCODE Table (28).

MISCL - MISCELLANEOUS HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).

OPEND - Openings Repeating group

1. Valid ENTRY must exist.
2. CONST Header must exist.
3. Material code must be in XCODE Table (14).
4. Type openings code must be in XCODE Table (18).
5. Method made code must be in XCODE Table (19).
6. Depth to bottom must be $>$ Depth to top of interval.
7. Depth to top of interval must $\neq$ zero.
8. Depth to bottom of interval must $\neq$ zero.
9. Diameter must $\neq$ zero.
10. A Casing Repeating group must exist. If it does not, return to the main menu.
11. Depth to top of interval must be $\leq$ Depth to bottom stored previously in ENTRY unless this is Repeating group 1 or unless the diameter of this interval differs from the diameter previously stored in ENTRY.
12. Diameter of interval may not increase with increasing depth.
13. Depth to bottom of interval must be $\leq$ Depth to bottom of Hole stored in ENTRY.

14. Depth to top and bottom of most recent interval are stored in ENTRY as well as being stored here.
15. Diameter of most recent interval is stored in ENTRY as well as being stored here.

OTHDD - Other data Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.
3. Data type code must be in XCODE Table (30).
4. Format code must be in XCODE Table (31).

OTHID - Other identifier Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.
3. Other identifier may not be blank.

OWNRD - Owner Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.
3. Ownership date must be valid date.
4. Owner may not be blank.

PENED - Penetration rate Repeating group

1. Valid ENTRY must exist.
2. LOGS Header must exist.
3. Depth to bottom of interval is required.
4. Depth to bottom must be > Depth to top of interval.
5. Depth to bottom of interval must be $\geq$ Depth completed stored in ENTRY unless Depth completed = 0.
6. Diameter of interval must be > zero.
7. Penetration rate must be > zero.

PUMPT - PUMPING TEST HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).
3. Date started must $\neq$ zero.
4. Date started must be a valid date.
5. Method tested code must be in XCODE Table (29).
6. Date started must be after Completion date.

REFSD - References Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.

SAMPD - Water sample Repeating group

1. Valid ENTRY must exist.
2. SAMPL Header must exist.
3. Date sampled must be a valid date.
4. Date sampled must $\neq$ zero.
5. Time sampled must be a valid time.
6. Sample number may not be blank.

SAMPL - WATER SAMPLE HEADER

1. Valid ENTRY must exist.
2. Reporting institution must be in XCODE Table (10).

SEARD - Search status Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.

SITE -MAIN MENU SCREEN

1. Get current computer date and format to YYYYMMDD.
2. Reporting institution must be in XCODE Table (10).
3. Latitude of map number must be valid.
4. Longitude of map number must be valid.
5. Half degree code must be valid (A,B,C, or D).
6. Quarter degree code must be valid (A,B,C, or D).
7. If Number on map equals zero then determine next number for that map.
Transaction type must be ADD.
8. If Number on map is $>$ zero then check that it does not exist already (if
Transaction type is ADD). If it does exist, then allocate next available
number.

SPECD - Special cases Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.
3. Method construction code must be in XCODE Table (13).
4. Number of holes must be $>$ zero.
5. This Repeating group may not repeat within the same MISCL Header.

STESD - Site selection Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.
3. Date selected must be a valid date.
4. Description may not be blank.
5. This Repeating group may not repeat within the same MISCL Header.

3 FUNCTIONAL DECOMPOSITION 9

STEVD - Site visits Repeating group

1. Valid ENTRY must exist.
2. MISCL Header must exist.
3. Date visit must be a valid date.
4. Date visit must $\neq$ zero.
5. Visitor may not be blank.

UNCOD - Unconsolidated Repeating group

1. Valid ENTRY must exist.
2. LOGS Header must exist.
3. Depth to top of interval must be $\leq$ Depth completed stored in ENTRY unless Depth completed = 0.
4. Geological formation code must be in XLITH Table.
5. Primary colour code must be in XCODE (33).
6. Secondary colour code must be in XCODE (34).
7. If Secondary colour code is not blank then Primary colour code may not be blank.
8. If Primary colour code (black) then Secondary colour code must be blank.
9. If Primary colour code (white) then Secondary colour code must be blank.
10. Texture code must be in XCODE Table (35).
11. Primary and Secondary feature code must be in XCODE Table (36).
12. If Secondary feature code is not blank then Primary feature code may not be blank.
11. Feature attribute code must be in XCODE (37).
12. Sorting code must be in XCODE (38).
13. Roundness code must be in XCODE (39).
14. Sum of the seven Sieve analysis percentages must be either 100 or zero.

XINQU - INQUIRY SCREEN

1. If one grid limit is given, all four are required.
2. Latitude minimum must be $<$ latitude maximum.
3. Longitude minimum must be $<$ longitude maximum.
4. Output option must be P or T.

FUNCTIONAL DECOMPOSITION OF VALID DATE

1. If Date = zero then no validation is carried out.
2. Must be > 19000000 .
3. Must be $\leq$ Run date.
4. If Day is given then Month must be between 1 and 12.
5. Month must be ≤ 12 .
6. Day must be $\leq$ number of days in the month (leap year test for February included).
7. Note that all dates are 8 digits long and in the format YYYYMMDD.

FUNCTIONAL DECOMPOSITION OF VALID TIME

1. If Time = 2400 then do not validate further (missing Time).
2. Hours must be between 0 and 23, inclusive.
3. Minutes must be between 0 and 59, inclusive.

FUNCTIONAL DECOMPOSITION OF VALID LATITUDE DEGREES

1. Latitude degrees must be ≥ 22 .
2. Latitude degrees must be ≤ 34 .

FUNCTIONAL DECOMPOSITION OF VALID LONGITUDE DEGREES

1. Longitude degrees must be ≥ 16 .
2. Longitude degrees must be ≤ 32 .

4 POPULATIONS OF DATA SETS

Numbers of records allowed per data set as in May 1988. These volumes can be increased when necessary.

ENTRY	51 000
LOGS 50 000	
PENED	20 000
AQUID	40 000
UNCOD	25 000
GEOLD	200 000
CONST	12 000
HOLED	10 000
CASED	10 000
OPEND	2 000
FILLD	500
INSTL	500
DISCH	30 000
DISCD	30 000
LEVEL	30 000
LEVED	40 000
LEVEA	100 000
SAMPL	3 000
SAMPD	10 000
FIELM	10 000
FIEDD	1 000
FIELA	10 000
METER	1 000
METED	4 100

4 DATA SET POPULATION 2

PUMPT	500
MISCL	50 000
STESD	6 000
OWNRD	50 000
OTHID	50 000
OTHDD	500
STEVD	500
SPECD	50
REFSD	5 000
SEARD	55 000
COMMD	10 000
XCODE	600
XDIST	1 000
XAQUI	1 000
XLITH	1 000
XSECU	1 000
XTRCT	1 000
XTRAN	40 000
XCONV	2 000

5 MAINTENANCE

5.1 PROGRAM MAINTENANCE

Tasks for a maintenance programmer include the following:

1. orientation and familiarization with existing system,
2. correction of errors reported by users,
3. changes and additions requested by users,
4. maintenance of documentation with respect to corrections and changes,
5. re-compilations after system software upgrades,
6. checking of audit trails and LINC logs,
7. initialization of XTRAN data set after printing of LOGGER report and acceptance by user,
8. incrementing of data set populations when necessary,
9. development of interface between Burroughs and IBM PC-compatible for file transfer and
10. finalization of GLI batch data loading facility.

Of these tasks, the first is a one-time effort for a programmer who is not familiar with the system. All the other tasks will have to be dealt with on a contingency basis as and when necessary but it is anticipated that an average input of about one day per week will be necessary.

To give some idea of the size of the Ground-water Data base system, the following statistics are provided. The existing system consists of the following:

1. about 1 000 lines of ALGOL/FORTRAN source statements,
2. 4 DO-files,
3. 30 JOB-files,
4. 96 DMS II structures and
5. 42 LINC components.

5.2 CODE MAINTENANCE

1 XCODE - CODE LISTS

This screen is only accessible from the main menu by the Data base administrator's User id code. All the general codes used by the system (excepting Lithology, District and Aquifer) are stored in this component.

1.1 Code reference number

Each code is given a unique reference number, which is the ordinate of the component, for facilitating retrieval. Format is NNNN. *This field is required.*

New numbers must be allocated between existing numbers so that the lists are maintained in a logical sequence. Initially codes were allocated reference numbers in increments of 2 with each Code list starting with NN 01 to allow for expansion. NN represents the Code list number.

1.2 Code list number

Each code list has been numbered. A list of XCODE tables in numerical sequence is given in the Table on page 5. Tables are referred to by these numbers in the section on Functional decomposition. Format is NNN.

1.3 Code

This is the code value. It may be blank, if appropriate. Format is 4A.

Notes

If required, records may be marked for deletion under CANDE and they will then be deleted as part of the normal deletion process.

Looping within this screen is terminated by entering "ESC" in the Transaction field or "BEGIN" in the page 2 screen.

2 XDIST - DISTRICT CODES

This screen is only accessible from the main menu by the Data base administrator's User id code. Registration district codes are stored in this component.

2.1 District code

The District code in format 3A is stored in this field. As it is the ordinate of the component it must be entered together with INQ in the Transaction field to recall an existing code. The first character indicates the Province and the second and third character the District within the Province. *This field is required.*

2.2 District name

The District name in format 40A is stored in this field.

Notes

If required, records may be marked for deletion under CANDE and they will then be deleted as part of the normal deletion process.

Looping within this screen is terminated by entering "ESC" in the Transaction field or "BEGIN" in the page 2 screen.

3 XAQUI - AQUIFER CODES

This screen is only accessible from the main menu by the Data base administrator's User id code.

3.1 Aquifer group code

This is a 2-digit code (format NN) identifying the group to which the aquifer belongs. Groups are numbered consecutively from 1. *This field is required.*

3.2 Aquifer code

This is a 4-character code (format 4A) which, together with the group code, uniquely identifies an aquifer. *This field is required.*

3.3 Aquifer name

This is a description of the aquifer in format 40A.

3.4 Aquifer record number

For reference, each aquifer record has been allocated a number in the format 3N. This number is required and is the ordinate of the component. New numbers must be allocated at the end of the list. As this field is the ordinate of the component, it must be entered together with INQ in the Transaction field to recall an existing Aquifer code record.

Notes

If required, records may be marked for deletion under CANDE and they will then be deleted as part of the normal deletion process.

Looping within this screen is terminated by entering "ESC" in the Transaction field.

In the Aquifer Repeating group, where these codes are applied, the Aquifer group code and Aquifer code are always treated as a single 6-character code.

For completeness, codes for Aquifer groups have been created in addition to the Aquifer codes. These have been given numeric codes to differentiate them from actual Aquifer codes. The Aquifer code in these cases is the Aquifer group code with leading zeros to make it a 4-digit number.

4 XLITH - LITHOLOGY CODES

This screen is only accessible from the main menu by the Data base administrator's User id code.

4.1 Lithology code

This is the field in which Lithology codes are stored. It is in the format 4A. As this is the ordinate of the component, it must be entered together with INQ in the Transaction field to recall an existing lithology code record..

4.2 Lithology description

This is a description of the lithology code in format 40A.

Notes

If required, records may be marked for deletion under CANDE and they will then be deleted as part of the normal deletion process.

Looping within this screen is terminated by entering "ESC" in the Transaction field or "BEGIN" in the page 2 screen.

5 XSECU - USER IDENTIFICATIONS AND PASSWORDS

This screen is only accessible from the main menu by the Data base administrator's Reporting institution code. Furthermore the master password has to be entered before any transaction will be processed.

5.1 Master password

This is the master password as defined in S/LINC/BOREDB1 and is displayed in secured video on the screen. Format is 6A. This field is required.

5.2 Record number

Records in this component are numbered sequentially by the Data base administrator. This number becomes the ordinate of the record and is in the format 6N. *This field is required.* As this is the ordinate, it must be entered together with INQ in the Transaction field to recall an existing XSECU record.

5.3 User identifier

This is the name or other identifier of the user of the Data base in the format 20A. *This field is required.*

5.4 Password

This is the password attached to the user identifier. It is in the format of 6A and displayed in secured video on the screen. *This field is required.*

5.5 Inquiry/Update indicator

This is either "T" to indicate that inquiries only are allowed by this user or "U" to indicate that updates are allowed by this user. *This field is required.*

5.6 Create date

This field is filled in by the computer and user intervention is not possible. It is always equal to run-date.

5.7 Expiry date

A date in the format YYYYMMDD, later or equal to create date. *This field is required.* Records with expiry dates < run date will be removed automatically by the Delete program.

6. MASTERPASSWORD AND REPORTING INSTITUTION

The Master password is defined on line 1050600 of S/LINC/BOREDB. If it is changed, then the program has to be recompiled.

5.3 XCODE TABLES IN NUMERICAL SEQUENCE

WITH INDICATION WHERE THE TABLES ARE USED.

1. Topographic setting (ENTRY).
2. Method of measurement; altitude (ENTRY).
3. Site type (ENTRY).
4. Site selector (ENTRY)
5. Information source (ENTRY, etc).
6. Status of site (ENTRY, etc).
7. Purpose of site (ENTRY).
8. Water use: consumer (ENTRY).
9. Water use: application (ENTRY).
10. Reporting institution (ENTRY and all Headers).
11. Equipment (ENTRY).
12. Potability (ENTRY).
13. Method of construction (CONST).
14. Type of finish (CONST & OPEND).
15. Method of development (CONST).
16. Special development treatment (CONST).
17. Casing material (CASED).
18. Type of openings (OPEND).
19. Method of openings made (OPEND).
20. Type of fill (FILLD).
21. Type of power (INSTL).
22. Monitoring facility (INSTL).
23. Type of discharge (DISCH).
24. Method discharge measured (DISCH).
25. Method of measurement (LEVEL).
26. Water-level status (LEVEL).
27. Parameter measured (FIELM).
28. Type of meter read (METER).
29. Method tested (PUMPT).
30. Data type (OTHDD).
31. Format (OTHDD).
32. Coordinate accuracy (ENTRY).
33. Primary colour (GEOLD).
34. Secondary colour (GEOLD).
35. Texture (GEOLD).
36. Feature (GEOLD).

6 TRANSACTION LOGS

Transaction logs are records of every updating transaction processed by the computer. LINC records these transactions. There are two ways to extract transaction logs from the system. The first makes use of a Burroughs-supplied program - BOREDB/LINCLOG and the second uses LOGGER written specially to facilitate vetting of data loaded to the system in both Batch and On-line modes. Both of these transaction logging systems will be needed by the Data Base Administrator.

6.2.1 BOREHOLE/LINCLOG

To run this program under CANDE see page 620 of the LINC Installations and operations manual (No 1163953).

6.2.2 LOGGER

LINC

This program can be run under LINC and under CANDE. Under LINC the following command has to be transmitted in line-at-a-time mode from a clean page:

RUN LOGGER <XMT>.

Thereafter the Id code of the user whose log is required, the begin date of the log and whether all details (A) are required or the summary (S) only. The printer file(s) are stored under LINCBD on the backup file. Once the message is received that the job is completed, the printer file can be printed by entering the instruction

U PRINT XXX LINCBD/= ON BACKUP <XMT>.

Note that files from all users are stored under LINCBD.

CANDE

To run this program under CANDE, get the file D/LIRC/LOGGER and list it:

G D/LIRC/LOGGER <XMT>

L <XMT>.

6 TRANSACTION LOGS 2

Then change the user number*n* in line 1500, the requested starting date in line 1600 and an 'A' (if all detail is required) or a 'S' (if a summary only is wanted) in line 1700. Transmit and save the new values in the working file.

00001500<n> <XMT>

00001600<YYYYMMDD> <XMT>

00001700A <XMT>

SA <XMT>.

Thereafter the logger program can be run with the following command:

ST J/LIRC/LOGGER (25, "XX") <XMT>

where *XX* is any suitable name from 1 to 17 characters long under which the printout is to be stored.

To print the log report, enter:

U PRINT NNN TERM / 000number1 / 000number2 /= ON
BACKUP <XMT>

where *NNN* = printer number,
 TERM = Terminal name (e.g. NET15)
 number1 = CANDE session number and
 number2 = task number of the program.

Enter P, R or N for Print, Remove or Next following the guidelines given on page 5 of Chapter 1.6 Inquiries.

This program prints each selected transaction record as it appears after the transaction has taken place. Records are sorted by the following keys, each in ascending order:

Global source (System variable, i.e. G for GLI and T for Terminal)

Component number (e.g. 010 for ENTRY)

Site id code

Header number (if applicable)

Repeating group number (if applicable)

Global unique number (System variable, a transaction number which appears on the top line of each screen).

EXAMPLE OF PRINTOUT FROM BOREDB/LOG COMMAND LOG NUMBER 01

TUESDAY 21 JAN 86 NATIONAL GROUND-WATER DATA BASE

** INPUT LOG ** LINC10 LOG NUMBER-001 PAGE 1

** INPUT REQUIREMENTS WERE - LOG =01 PRINT=ALL

GLB-SOURCE =T	GLB-STNNO =100	ISPEC =BEGIN	** LOG SYNC NUMBER 000001
INPUT-DATE =21JAN86	BEGIN01 =HENNIE		TRANNO =003281
BEGIN02 =HH			
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =SITE	** LOG SYNC NUMBER 000002
INPUT-DATE =21JAN86	SITETR =ADD	SITE01 =	TRANNO =003281
SITE03 =165	SITE04 =19860121	SITE05 = 0	SITE02 = 0
SITENX =850			SITE06 = 0
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =XINQU	** LOG SYNC NUMBER 000003
INPUT-DATE =21JAN86	ACTMTH =8601	XINQU01 =FARM	TRANNO =003281
XINQU02 =KI			
XINQU03 =19860121	XINQU07 =	XINQU08 = 0	XINQU0A = 0
XINQU09 = 0	XINQU9A = 0	XINQU10 = 0	XINQU0A = 0
XINQU11 = 0	XINQU1A = 0	XINQU12 =0	XINQU13 =TR
XINQU14 = 167	XINQU15 =	XINQU04 =	XINQU05 = 0
XINQU06 =19860121	XINQU16 =X	XINQU17 =	XINQU18 =
XINQU19 =	XINQU20 =	XINQU21 =	XINQU22 =
XINQU23 =	XINQU24 =	XINQU25 =	XINQU26 =
XINQU27 =	XINQU28 =	XINQU29 =X	XINQU30 =P
XINQU31 =			
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =XINQU	** LOG SYNC NUMBER 000004
INPUT-DATE =21JAN86	ACTMTH =8601	XINQU01 =3025BA	TRANNO =003282
XINQU02 =KI			
XINQU03 =19860121	XINQU07 =	XINQU08 =30	XINQU0A =00000
XINQU09 =30	XINQU9A =24999	XINQU10 =25	XINQU0A =50000
XINQU11 =25	XINQU1A =74999	XINQU12 =	XINQU13 =
XINQU14 =	XINQU15 =	XINQU04 =	XINQU05 = 0
XINQU06 =19860121	XINQU16 =X	XINQU17 =	XINQU18 =
XINQU19 =	XINQU20 =	XINQU21 =	XINQU22 =
XINQU23 =	XINQU24 =	XINQU25 =	XINQU26 =
XINQU27 =	XINQU28 =	XINQU29 =X	XINQU30 =P
XINQU31 =Y			

SUCCESSFUL CLOSE000005

TUESDAY 21 JAN 86 NATIONAL GROUND-WATER DATA BASE

** STATION STATS ** LINC10 LOG NUMBER-001 PAGE 1

STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS

100 4 0:

TUESDAY 21 JAN 85 NATIONAL GROUND-WATER DATA BASE

** ISPEC STATS **

LINC10 LOG NUMBER-001

PAGE

1

ISPEC INPUT ERRORS: ISPEC INPUT ERRORS: ISPEC INPUT ERRORS: ISPEC INPUT ERRORS: ISPEC INPUT ERRORS: ISPEC INPUT ERRORS: ISPEC INPUT ERRORS

BEGIN 1 0: SITE 1 0: XINQU 2 0:

EXAMPLE OF PRINTOUT FROM BOREDB/LOG COMMAND
LOG NUMBER 02

TUESDAY 21 JAN 86 NATIONAL GROUND-WATER DATA BASE

** I N P U T L O G ** LINC10 LOG NUMBER-002 PAGE 1

** INPUT REQUIREMENTS WERE - LOG =02 PRINT=ALL

GLB-SOURCE =T	GLB-STNNO =100	ISPEC =BEGIN	** LOG SYNC NUMBER 000001
INPUT-DATE =21JAN86	BEGIN01 =HENNIE		TRANNO =003282
BEGIN02 =HH			
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =SITE	** LOG SYNC NUMBER 000002
INPUT-DATE =21JAN86	SITETR =INQ	SITE01 =302588	TRANNO =003282
SITE03 =IGS	SITE04 =19860121	SITE05 = 01	SITE02 = 0122
SITENX =061			SITE04 = 01
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =LEVED	** LOG SYNC NUMBER 000003
INPUT-DATE =21JAN86	ACTMTH =8601	LEVEDTR =ESC	TRANNO =003282
LEVED02 = 1	LEVED03 = 1	LEVED04 =19770321	ENTRY01 =30258800122
LEVED06 = 5.10	+ LEVED07 =	LEVEDNX = 0	LEVED05 =2400
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =SITE	** LOG SYNC NUMBER 000004
INPUT-DATE =21JAN86	SITETR =INQ	SITE01 =302588	TRANNO =003282
SITE03 =IGS	SITE04 =19860121	SITE05 = 01	SITE02 = 0130
SITENX =061			SITE04 = 01
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =LEVED	** LOG SYNC NUMBER 000005
INPUT-DATE =21JAN86	ACTMTH =8601	LEVEDTR =CHG	TRANNO =003282
LEVED02 = 1	LEVED03 = 1	LEVED04 =19770321	ENTRY01 =30258800130
LEVED06 = 20.	+ LEVED07 =	LEVEDNX = 0	LEVED05 =2400
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =LEVED	** LOG SYNC NUMBER 000006
INPUT-DATE =21JAN86	ACTMTH =8601	LEVEDTR =ESC	TRANNO =003282
LEVED02 = 1	LEVED03 = 1	LEVED04 =19770321	ENTRY01 =30258800130
LEVED06 = 11.9	+ LEVED07 =	LEVEDNX = 0	LEVED05 =2400
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =LEVED	** LOG SYNC NUMBER 000009
INPUT-DATE =21JAN86	ACTMTH =8601	LEVEDTR =INQ	TRANNO =003282
LEVED02 = 1	LEVED03 = 1	LEVED04 =19770321	ENTRY01 =30258800130
LEVED06 = 11.90	+ LEVED07 =	LEVEDNX =918	LEVED05 =2400
GLB-SOURCE =T	GLB-STNNO =100	ISPEC =LEVED	** LOG SYNC NUMBER 000010
INPUT-DATE =21JAN86	ACTMTH =8601	LEVEDTR =ESC	TRANNO =003282
LEVED02 = 1	LEVED03 = 1	LEVED04 =19770321	ENTRY01 =30258800130
LEVED06 = 11.90	+ LEVED07 =	LEVEDNX =918	LEVED05 =2400

TUESDAY 31 JAN 86 NATIONAL GROUND-WATER DATA BASE

** STATION STATS ** LINC10 LOG NUMBER-002 PAGE 1

STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS: STATION INPUT ERRORS

100 59 2:

TUESDAY 21 JAN 86 NATIONAL GROUND-WATER DATA BASE

** ISPEC STATS **

LINC10 LOG NUMBER-002

PAGE

1

ISPEC	INPUT ERRORS:	ISPEC	INPUT ERRORS:	ISPEC	INPUT ERRORS:	ISPEC	INPUT ERRORS:	ISPEC	INPUT ERRORS:	ISPEC	INPUT ERRORS:
BEGIN	1 0:	SITE	21 0:	LEVED	11 0:	SEARD	11 0:	OWNRD	B 0:	BEDLD	2 1
LOGS	1 0:	AQUID	1 1:	ENTRY	3 0:						

EXAMPLE OF PRINTOUT FROM LOGGER/LIRC COMMAND
(1. PART OF PROGRAM)

ENTRY	MAP C	MAP N	FARM	SITE NAME	TOPO	LATITUDE	LONGITUDE	DRAIN	METH	SEL	
DEPTH	INFO	PUR	APP	EQUI	DATE E	DATE U	COMMENT	ACC	ALT	TYP	DIAM
DATE C	STAT	CNS	REP	I	POT						
3025BB00363	3025BB	363	DTR	274	HEATHER DOWNS						
33.50	19600000	R	G	P	N	AI	IGS	W	19860120	19860120	
									A	R	30.17240 25.82040 2 1480.00 M B 0
3025BB00364	3025BB	364	DTR	274	HEATHER DOWNS						
18.30	19600000	R	G	P	N	AS	IGS	W	19860120	19860120	
									A	F	30.17200 25.81960 2 1480.00 M B 0
3025BB00365	3025BB	365	DTR	402	DE DAM						
6.10	19490000	R	G	P	N	AI	IGS	W	19860120	19860120	
									A	R	30.17620 25.83670 2 1479.00 M B 0
3025BB00366	3025BB	366	DTR	402	DE DAM						
5.50	19650000	R	G	P	N	AI	IGS	W	19860120	19860120	
									A	F	30.17670 25.83750 2 1478.00 M B 0
3025BB00367	3025BB	367	DTR	402	DE DAM						
36.60	09000000	R	G	P	N	AS	IGS	W	19860120	19860120	
									A	F	30.17690 25.83790 2 1479.00 M B 0
3025BB00368	3025BB	368	DTR	274	HEATHER DOWNS						
0.00	00000000										
									A	R	30.03770 25.85950 2 1478.00 M F 0
3025BB00369	3025BB	369	DTR	116	VAN IJLSSPRUIT						
30.50	00000000	R	G	P	N	DA	IGS	W	19860120	19860120	
									A	F	30.08420 25.88990 2 1409.00 M B 0
3025BB00370	3025BB	370	DTR	223	GELUK						
15.20	19480000	R	G	P	N	AI	IGS	S	19860120	19860120	
									A	F	30.08420 25.89010 2 1440.00 M B 0
3025BB00371	3025BB	371	DTR	223	GELUK						
18.30	00000000	R	U								
									A	F	30.07010 25.89160 2 1436.00 M B 0
3025BB00372	3025BB	372	DTR	223	GELUK						
18.30	19690000	R	G	P	N	AS	IGS	W	19860120	19860120	
									A	F	30.08180 25.90070 2 1452.00 M B 0
3025BB00373	3025BB	373	DTR	223	GELUK						
15.20	00000000	R	G	P	N	AS	IGS	W	19860120	19860120	
									A	F	30.08150 25.88790 2 1438.00 M B 0
3025BB00374	3025BB	374	DTR	223	GELUK						
15.20	19470000	R	G	P	N	AI	IGS	C	19860120	19860120	
									A	R	30.08440 25.88850 2 1439.00 M B 0
3025BB00375	3025BB	375	DTR	167	SPREEUWFOONTEIN						
0.00	00000000										
									A	R	30.09930 25.92740 2 1486.00 M F 0
3025BB00376	3025BB	376	DTR	46	ERF DEEL						
18.30	00000000	R	G	P	N	AS	IGS		19860120	19860120	
									A	R	30.06080 25.84600 2 1414.00 M B 0
3025BB00377	3025BB	377	DTR	15	KLEIN MATJESVLEI						
18.30	00000000	R	G	P	N	AS	IGS				

EXAMPLE OF PRINTOUT FROM LOGGER/LIRC COMMAND
(1. PART OF PROGRAM)

DISCHARGE RATE	HDR	REP	DATE	H TIME	RATE	COMMENT
30258800363	1	1	19600000	2400	8.83	A
30258800364	1	1	19600000	2400	2.52	A
30258800365	1	1	19490000	2400	12.62	A
30258800370	1	1	19480000	2400	7.57	A
30258800370	1	2	19480000	2400	7.53	A
30258800372	1	1	19690000	2400	2.53	A
30258800374	1	1	19470000	2400	7.57	A
30258800389	1	1	19740000	2400	2.53	A
30258800391	1	1	19740000	2400	0.75	A

LEVEL HEADER	HDR	REP	I	DATE	E ME	COLLR
	PZ				STAT	SRCE
30258800006	1	0	IGS	19851015	99.99	A
30258800006	1	0	IGS	19851015	99.99	A
30258800043	1	0	IGS	19860120	99.99	A
30258800363	1	0	IGS	19860120	99.99	A
30258800370	1	0	IGS	19860120	99.99	A
30258800372	1	0	IGS	19860120	99.99	A
30258800389	1	0	IGS	19860120	99.99	A
30258800391	1	0	IGS	19860120	99.99	A

WATER-LEVEL	HDR	REP	DATE	H TIME	LEVEL	COMMENT
30258800006	1	1	19770302	2400	7.00	A
30258800006	1	1	19770302	2400	7.00	A
30258800036	1	1	19770325	2400	1.20	C
30258800043	1	1	19400000	2400	6.60	A
30258800043	1	2	19770302	2400	15.00	A
30258800363	1	1	19600000	2400	3.10	A
30258800370	1	1	19480000	2400	23.00	A
30258800372	1	1	19690000	2400	6.00	A
30258800389	1	1	19740000	2400	1.30	A
30258800391	1	1	19740000	2400	15.00	A
30258800391	1	2	19770000	2400	12.00	A

SAMPLE HEADER	HDR	REP	I	DATE	E
30258800390	1	IGS	19860120	A	
30258800405	1	IGS	19860120	A	

EXAMPLE OF PRINTOUT FROM LOGGER/LIRC COMMAND
(2. PART OF PROGRAM)

4	T	10	30258800363	0	0	8128	NET15	8112642	3091	1	19860120	ADD	HENNIE
4	T	10	30258800364	0	0	8143	NET15	8144388	3098	1	19860120	ADD	HENNIE
4	T	10	30258800365	0	0	8155	NET15	8173722	3103	1	19860120	ADD	HENNIE
4	T	10	30258800366	0	0	8166	NET15	8211934	3108	1	19860120	ADD	HENNIE
4	T	10	30258800367	0	0	8173	NET15	8233990	3111	1	19860120	ADD	HENNIE
4	T	10	30258800368	0	0	8180	NET15	8252808	3114	1	19860120	ADD	HENNIE
4	T	10	30258800369	0	0	8183	NET15	8270058	3115	1	19860120	ADD	HENNIE
4	T	10	30258800370	0	0	8186	NET15	8292199	3116	1	19860120	ADD	HENNIE
4	T	10	30258800371	0	0	8213	NET15	8341675	3129	1	19860120	ADD	HENNIE
4	T	10	30258800372	0	0	8230	NET15	8375957	3137	1	19860120	ADD	HENNIE
4	T	10	30258800373	0	0	8255	NET15	8470502	3149	1	19860120	ADD	HENNIE
4	T	10	30258800374	0	0	8272	NET15	8583489	3157	1	19860120	ADD	HENNIE
4	T	10	30258800375	0	0	8293	NET15	9025369	3167	1	19860120	ADD	HENNIE
4	T	10	30258800376	0	0	8296	NET15	9044836	3168	1	19860120	ADD	HENNIE
4	T	10	30258800377	0	0	8309	NET15	9213804	3174	1	19860120	ADD	HENNIE
4	T	10	30258800378	0	0	8322	NET15	9252788	3180	1	19860120	ADD	HENNIE
4	T	10	30258800379	0	0	8337	NET15	9291630	3187	1	19860120	ADD	HENNIE
4	T	10	30258800380	0	0	8352	NET15	9323821	3194	1	19860120	ADD	HENNIE
4	T	10	30258800381	0	0	8377	NET15	9383334	3202	1	19860120	ADD	HENNIE
4	T	10	30258800382	0	0	8390	NET15	9431420	3208	1	19860120	ADD	HENNIE
4	T	10	30258800383	0	0	8405	NET15	9465756	3215	1	19860120	ADD	HENNIE
4	T	10	30258800384	0	0	8408	NET15	9492993	3216	1	19860120	ADD	HENNIE
4	T	10	30258800385	0	0	8411	NET15	9554337	3217	1	19860120	ADD	HENNIE
4	T	10	30258800386	0	0	8414	NET15	10010604	3218	1	19860120	ADD	HENNIE
4	T	10	30258800387	0	0	8417	NET15	10425576	3219	1	19860120	ADD	HENNIE
4	T	10	30258800388	0	0	8420	NET15	10435671	3220	1	19860120	ADD	HENNIE
4	T	10	30258800389	0	0	8423	NET15	10451616	3221	1	19860120	ADD	HENNIE
4	T	10	30258800390	0	0	8442	NET15	10595570	3230	1	19860120	ADD	HENNIE
4	T	10	30258800391	0	0	8450	NET15	11293653	3233	1	19860120	ADD	HENNIE
4	T	10	30258800392	0	0	8478	NET15	11370071	3246	1	19860120	ADD	HENNIE
4	T	10	30258800393	0	0	8481	NET15	11381654	3247	1	19860120	ADD	HENNIE
4	T	10	30258800394	0	0	8484	NET15	11391783	3248	1	19860120	ADD	HENNIE
4	T	10	30258800395	0	0	8487	NET15	11402342	3249	1	19860120	ADD	HENNIE
4	T	10	30258800396	0	0	8490	NET15	11412525	3250	1	19860120	ADD	HENNIE
4	T	10	30258800397	0	0	8493	NET15	11422405	3251	1	19860120	ADD	HENNIE
4	T	10	30258800399	0	0	8500	NET15	11471194	3252	1	19860120	ADD	HENNIE
4	T	10	30258800400	0	0	8503	NET15	11484005	3253	1	19860120	ADD	HENNIE
4	T	10	30258800401	0	0	8506	NET15	11494339	3254	1	19860120	ADD	HENNIE
4	T	10	30258800402	0	0	8515	NET15	11512455	3258	1	19860120	ADD	HENNIE
4	T	10	30258800403	0	0	8518	NET15	11523034	3259	1	19860120	ADD	HENNIE
4	T	10	30258800404	0	0	8521	NET15	11533679	3260	1	19860120	ADD	HENNIE
4	T	10	30258800405	0	0	8524	NET15	11545873	3261	1	19860120	ADD	HENNIE
4	T	10	30258800406	0	0	8531	NET15	11582975	3264	1	19860120	ADD	HENNIE
4	T	20	30258800363	1	0	8138	NET15	8130475	3096	1	19860120	ADD	HENNIE
4	T	20	30258800364	1	0	8150	NET15	8155194	3101	1	19860120	ADD	HENNIE
4	T	20	30258800365	1	0	8157	NET15	8174663	3104	1	19860120	ADD	HENNIE
4	T	20	30258800366	1	0	8168	NET15	8212659	3109	1	19860120	ADD	HENNIE
4	T	20	30258800367	1	0	8175	NET15	8234687	3112	1	19860120	ADD	HENNIE
4	T	20	30258800370	1	0	8198	NET15	8305720	3122	1	19860120	ADD	HENNIE
4	T	20	30258800371	1	0	8215	NET15	8342404	3130	1	19860120	ADD	HENNIE
4	T	20	30258800372	1	0	8240	NET15	8391335	3142	1	19860120	ADD	HENNIE
4	T	20	30258800373	1	0	8257	NET15	8472388	3150	1	19860120	ADD	HENNIE
4	T	20	30258800374	1	0	8278	NET15	8591717	3160	1	19860120	ADD	HENNIE
4	T	20	30258800391	1	0	8452	NET15	11294493	3234	1	19860120	ADD	HENNIE
4	T	22	30258800363	1	1	8140	NET15	8133042	3097	1	19860120	ADD	HENNIE
4	T	22	30258800364	1	1	8152	NET15	8161829	3102	1	19860120	ADD	HENNIE
4	T	22	30258800365	1	1	8159	NET15	8181583	3105	1	19860120	ADD	HENNIE
4	T	22	30258800366	1	1	8170	NET15	8221220	3110	1	19860120	ADD	HENNIE
4	T	22	30258800367	1	1	8177	NET15	8241341	3113	1	19860120	ADD	HENNIE
4	T	22	30258800370	1	1	8200	NET15	8312209	3123	1	19860120	ADD	HENNIE

```

      Q = 25
      S1 = "KI"
00000200  OPTION=(BDBASE);BDNAME= #S1 ;
00000300  %
00000400  %      JOB DECK FOR RUNNING LOGGER
00000500  %
00000600  %  DESTNAME=NET16 ;
00000700  CLASS=0 ;
00000800  TASK T ;
00000900  INTEGER I ;
00001000  STRING S2 ;
00001100  S2 := "OUTPUT WILL BE FOUND UNDER " & S1 & "/= ON BACKUP" ;
00001200  DISPLAY S2 ;
00001300  I := MYSELF(SOURCESTATION) ;
00001400  T (STATION = I) ;
00001500  RUN BOREDB/LOGGER [T] ;
00001600  END JOB

```

J O B S U M M A R Y

JAN 20, 1986

```

14:39:04      BOJ 9917  LOGGER.
                      JOB ENTERED SYSTEM: JAN 20, 1986 14:39:03 FROM WFL 35.260
                      QUEUE: 25
                      ORIGINATING LSN: 226 MCS: 1
                      PRIORITY: 50
                      USERCODE: WIGS.
                      SUBSYSTEM: LINC
14:39:04      9917  DISPLAY:OUTPUT WILL BE FOUND UNDER KI/= ON BACKUP.
14:39:05      9917  STACK EXTENDED FROM 412 TO 570 WORDS.

14:39:05      BDT 9920  (WIGS)BOREDB/LOGGER ON W36.
                      CODE COMPILED: DEC 6, 1985 15:36:50 BY COBOL74 35.250
                      TASK TYPE: COROUTINE(CALL)
                      PRIORITY: 50
                      USERCODE: WIGS.
                      SUBSYSTEM: LINC
14:39:06      9920  STACK EXTENDED FROM 715 TO 895 WORDS.
14:39:11      9920  STACK EXTENDED FROM 895 TO 1000 WORDS.
14:39:12      9920  STACK EXTENDED FROM 1000 TO 1100 WORDS.
14:39:26      9920  STACK EXTENDED FROM 1100 TO 1200 WORDS.
14:41:58      EOT 9920  (WIGS)BOREDB/LOGGER ON W36.
                      PROCESSOR TIME: 00:00:16.809 USERCODE: WIGS.
                      I/O TIME: 00:00:19.341 LINES PRINTED: 920.
                      READYQ TIME: 00:00:39.400 AVERAGE MEMORY USAGE: CODE=6606, DATA=7255
                      INITPBIT TIME: 00:00:05.113 MEMORY INTEGRAL: CODE=238.806, DATA=262.272
                      OTHERPBIT TIME: 00:00:00.144 DATA & CODE ALLOWED IN & OCCUPIED: LOCAL 2.
                      ELAPSED TIME: 00:02:52.726 INITIAL PBITS: 3104, OTHER PBITS: 42.

                      COSTS :
                      CENTRAL PROCESSOR :      R1,66
                      I/O PROCESSOR :      R0,74
                      LINES PRINTED :      R0,89
                      SAVE MEMORY :      R0,43
                      OLAY MEMORY :      R0,04
                      TOTAL COST :      R3,76

```

14:41:59 EOJ 9917 LOGGER.
 PROCESSOR TIME: 00:00:00.138 USERCODE: WIGS.
 I/O TIME: 00:00:00.449 AVERAGE MEMORY USAGE: CODE=83, DATA=1148
 READYD TIME: 00:00:00.120 MEMORY INTEGRAL: CODE=0.049, DATA=0.675
 INITPBIT TIME: 00:00:00.047 DATA & CODE ALLOWED IN & OCCUPIED: LOCAL 2.
 ELAPSED TIME: 00:02:54.789 INITIAL PBITS: 33.

COSTS :
 CENTRAL PROCESSOR : R0,01
 I/O PROCESSOR : R0,02
 TOTAL COST : R0,03

***** TOTAL COSTS FOR JOB 9917 *****
 *
 * CENTRAL PROCESSOR : R1,67 17 SECS *
 * I/O PROCESSOR : R0,76 20 SECS *
 * LINES PRINTED : R0,89 920 LINES *
 * SAVE MEMORY : R0,43 6689 WORDS *
 * OLAY MEMORY : R0,04 8403 WORDS *
 *
 * TOTAL COST : R3,79 *
 *
 *PBR*****231184*

7 LINC CODING STANDARDS

(Based on Burroughs Advanced LINC Instructor Guide - 1983 with acknowledgments)

1 COMMENTS

1. 1 Separate each Section and ISPEC with a heading.
1. 2 Use comments for any complicated logic or notes for further testing.
1. 3 Use TEACH/HELP screens for narrative of the screen's actions and for additional operator information.

2 CONSISTENCY

2. 1 Use "=" when information follows the LINC/LIRC command, e.g. "POS=23".
2. 2 Use ";" when no additional value follows the command e.g. "END;".
2. 3 Indent nested levels of GROUP items 3 spaces.
2. 4 Indent all conditional and loop commands 3 spaces.

3 ABBREVIATIONS

3. 1 Abbreviate all commands in the Data section.
3. 2 Do not abbreviate any other commands.

4 OPTION and USER SECTION

4. 1 Include all of the Options rather than using default values.

5 PROFILE SECTION

5. 1 Group all the Profiles for each Component together.

6 GLOBAL SECTION

6. 1 Group the following - Elementary data items, Global work, Keywords, Group data items, Global logic
6. 2 All elementary data items begin with "GD-".
6. 3 All global work data items begin with "GW-".
6. 4 All group items begin with "GP-".
6. 5 All keywords begin with "KW-".
6. 6 All global logic has a ":GL" in columns 78-80.

6. 7 Include any constant used in multiple ISPECs in Global data e.g. GD-INQ (INQ), GGD-MENU (MENU) , GD-ASTERISK (*****), GD-1 (1) ED = N , GD-NOT-FND (*****).

7 COMPONENTS and EVENTS

7. 1 All of the Components should be in alphabetical order.
7. 2 All of the Events should be in alphabetic order after the Components.
7. 3 All US=INPUT inquiry screens should be Memo components.
7. 4 Put the ISPEC name in columns 67-72.

8 DATA SPECIFICATIONS

8. 1 Do not qualify data names unless ordinates.
8. 3 Line up the attributes and maintain a set sequence e.g.
 LI = 07 POS =.40 LE = 07 ED =.RA;
 LI =.08 POS = 30 LE = 04 ED =.RA.
8. 4 Keep all the displays in LINE and POS order and all the data in LINE and POS order
8. 5 Keep Displays and Data in screen LINE and POS order
8. 6 All fields should be right aligned.
8. 7 Do not use signed fields on data entry screens if avoidable. Make them unsigned US = INPUT on screen and signed USAGE = OUTPUT in the database.
8. 8 For inquiry screens make each line POS = 80 LE = 78 to eliminate delimiters.

9 LOGIC

9. 1 Surround loops with blank lines.
9. 2 Do not use multiple lines on one statement.
9. 3 Use GLOBAL.LOGIC for logic in more than one screen and do not repeat logic in more than one screen if avoidable.
9. 4 Indent conditional statements and loops.
9. 5 Comment as much as possible.
9. 6 Each label should begin with "LAB-".

10 LIRC

10. 1 Include some documentation/narrative at the beginning.
10. 2 Try to put as much logic as possible within the frame.
10. 3 Separate each frame with "-----" or "*****".

- 10 4 SETUP.DATA begin with SD-.
- 10 5 Group SETUP.DATA begin with SG-.
- 10 6 ACCEPT data begins with AX-.

11 EFFICIENT LINC

- 11. 1 Any literal used twice should be GLOBAL DATA or SETUP DATA.
- 11. 2 There is usually a way to avoid repetitive logic in a single ISPEC using a BEGIN.LOOP and a JUMP.TO. This is especially important with DT; LU; FLAG; AUTOs which generate many lines of COBOL.
- 11. 3 Break all loops as soon as possible.
- 11. 4 Only keep the lowest level of profiles
 - eg. by customer by ispec by date gives three profiles
 - by name by number for deletes and LU; FROM.
- 11. 5 Group your flags together.
- 11. 6 Do not do several DT; TOTAL for many totals, do a DT; EVERY and code the add routines so that the detail is only read once.
- 11. 7 Be careful with COPY.FROM where it is easy to read more records than you need to (see reference manual).
- 11. 8 Use subroutine for the logic needed in several different screens if it occurs in pre-screen logic.
- 11. 9 Global data tables should have most frequent data first.
- 11.10 Don't have profiles which are used in infrequent LIRCs. Do a sort instead.

8 QUME QVT109 TERMINAL STATUS LINE SETTINGS

The Status line setting for the QUME when used as a Ground-water Data base terminal are given below. To change the status line, press the Ctrl-Shift-Setup keys simultaneously. Once the cursor is in the Main Status Line, one can move it to any field in any of the seven Status Lines by pressing the cursor position arrow keys. When the configuration of the Status Lines is changed the new configuration can be written into memory by pressing Shift-S. Shift-D returns all values to the default values (see QVT Operator's Manual) while Shift-R recalls the previously saved configuration. By pressing the Setup key a second time the cursor will also exit the Status Line.

MAIN STATUS LINE

ON LINE	
CHAR MODE	
FDX	
PROT	OFF
KB	ON
AUX	OFF
MON	OFF
GRAPH	OFF

SET 1 STATUS LINE

SCROLL JUMP	(optional)
REPEAT ON	
CLICK	OFF (optional)
MARGIN BELL	OFF (optional)
E O M	NUL
COMPOSE	OFF

SET 2 STATUS LINE

LINE WRAP	OFF
LINE FEED	OFF
SCROLL	ON
DISPLAY PE	OFF

8 QUME SETTINGS 2

STD VID
X-ON ONLY

SET 3 STATUS LINE (HOST)

DATA BIT	8
BIT8	0
PARITY	OFF
PARITY BIT	ODD
STOP BIT	1
BAUD RATE	9600

SET 4 STATUS LINE (AUX)

DATA BIT	8
BIT8	0
PARITY	ON
PARITY BIT	ODD
STOP BIT	1
BAUD RATE	19200

SET 5 STATUS LINE

CURSOR	BLOCK
CURSOR	STEADY
HERE IS:	
TIME	ON
FREQ	60

SET 6 STATUS LINE

XPARENT	OFF
KB TYPE:	US
STATUS LINE	OFF
EMULATION	QVT109
F1:	A@M

9 NOTES

9.1 NOTES FOR DATAPoint PROGRAMMER

1. File must be transferred to WGROND PACK.
2. Record size = 14 words.
3. Block size = 420 words.
4. File title as given on Batch header sheet but under the (WIGS) Usercode.
5. The first record in a file must be a Batch header.
6. Thereafter data records must be encoded in the order given.
7. The first data record of each site entered must contain the Site id code (Map number in the case of ENTRY). All succeeding data records of the *same site must* have a *blank* Site id code.
8. Header record numbers and Repeating group numbers should always be coded with zero.
9. All alpha fields are left-justified.
10. All numeric fields are right-justified and left space filled.

9.2 PROGRAM MAINTENANCE NOTES

LIRC PROGRAMS

There are four LIRC programs for extracting data from the Data base, BOREDB/PRINTIDCODE, BOREDB/TRANSMITFILE, BOREDB/PRINTGRID and BOREDB/PRINTFARM. The first does all printer reports by Site id code and the second all transmission file reports, the third and fourth do extracts to printer by data sets according to Grid and Farm number respectively. Both make extensive use of copy books in their generation. The copy books should not be resequenced! Note that some of these copy books are also used by the Delete program.

GLI NOTES

BOREDB/PROGRAM must be in the mix before this job is attempted.

The preparation of negative numbers for GLI is complex. The procedure is explained in the B1000 Series LINC Installation and Operations Manual on page 2 - 17.

ACTUAL DELETION OF RECORDS

Deletion of records is done by the following command under CANDE:

ST J/LIRC/DELETE (25,"XX")

where *XX* is replaced by the directory name under which the output file is to be created on BACKUP (PACK). See INQUIRIES (6.1) for further detail of directory naming conventions.

As each record is deleted, a copy of it is written to a file under the directory *XX* on BACKUP. This file should be printed out (with U PRINT, see Inquiries) and kept as a record of data deleted from the data base.

LOGGER AND DUMPDB PROGRAMS

DUMPDB dumps the entire contents of the Data base to a printer backup file. It should only be used during development testing.

LOGGER prints a record of every transaction processed since a particular date, sequenced by User number.

DBOPEN UTILITY

A utility which opens the Data base when STARTed is provided (J/UTIL/DBOPEN). A single parameter, Queue, is required.

This program keeps the Data base open until

? < mix no> HI<F19>

is transmitted. This utility makes testing faster because individual programs are saved the overhead of opening the Data base each time they are executed.

The source of this program is S/UTIL/DBOPEN.

FILE VERSIONS

A program is provided which tests last access dates of nominated files against dates stored in a reference file. The purpose is to identify old versions of files which may have found their way to the disk pack and to identify files that have been removed in error.

This program (P/UTIL/FILEDATES) should be run daily and any errors should be investigated without delay.

The reference file is D/UTIL/FILEDATES ON WDATA. If necessary, files may be added to or taken out of the reference file.

Last access dates later than those on the reference file are reported and the reference file is updated (this is not an error condition).

SYSTEM BACKUP

A Job deck (J/UTIL/BACKUP) is provided which makes a copy to magnetic tape of all disk files on WGROND under the WIGS usercode. Two parameters must be provided: Queue and a Serial number to identify the copy. The tape label is WIGSYMMDDNN where the date is obtained from the system and NN is the serial number provided as a parameter.

The Data base should not be in use when this copy is made. Audit and log files on WDATA pack are not copied by this job deck although the Data base is copied.

Once in production, on-line dumps of the Data base should be taken.

Arrangements have been made for a cycle of six tapes to be retained by the Tape Library. No Term or Security copies are retained at present.

LIST OF DO-FILES AND WHAT THEY DO

DO/GO	Start of day routine - to be run daily after logging on in the morning
DO/INQ	Runs DMINQUIRY under CANDE
DO/COMP	Compiles LOADPARAMS2 program
DO/LIRC	Processes INQUIRY (XTRCT) files.

EXAMPLE OF PRINTOUT FROM DELETE COMMAND

```

###                                     19860207
1102727CA00004 01GS 19860108
1102727CA00009 01GS 19860109
0302728DD00006 00WA-61986020319831103
0 0.00
0202728DD00007 00WA-619860203
0302728DD00007 00WA-61986020319831102
0 0.00
0312728DD00007 0 0 0.00 10.00 165
0302728DD00007 00WA-61986020319831102
0 0.00
0302728DD00007 00WA-61986020319000000
0 0.00DELTE!
0302728DD00007 00WA-61986020419831102
0 0.00
0012827DB00119WA-619860206 0 0
0102827DB001192827DB 119DF10307TALANA
28.6166727.783330420 9999.99 BDWA 0 22.8619530828D WA-G
1986020619860206DRY
0202827DB00119 1WA-619860206
0232827DB00119 1 1 0.005NDS 0 0 0 0 0 0
0232827DB00119 1 2 4.57SHLE 0 0 0 0 0 0
0232827DB00119 1 3 22.86N.S. 0 0 0 0 0 0
1102827DB00143 0WA-619860204
0012827DB00160WA-619860205 0 0
0102827DB001602827DB 160DF10230WELBEDACHT
28.7000027.9000030420 9999.99 BOWN 0 36.8819530822D DAWA-G
1986020519860205
0202827DB00160 0WA-619860205
0232827DB00160 0 0 0.00SDSL 0 0 0 0 0 0BEAUFORT
0232827DB00160 0 0 18.28SHLE 0 0 0 0 0 0
0232827DB00160 0 0 33.22DLRT 0 0 0 0 0 0
0232827DB00160 0 0 36.88N.S. 0 0 0 0 0 0
0012827DB00163WA-619860205 0 0
0102827DB001632827DB 160DF10230WELBEDACHT
28.7000027.9000030420 9999.99 BOWN 0 36.8819530822D DAWA-G
1986020519860205DRY
0202827DB00163 1WA-619860205
0232827DB00163 1 1 0.00DLRT 0 0 0 0 0 0
0232827DB00163 1 2 18.28SHLE 0 0 0 0 0 0
0232827DB00163 1 3 33.22DLRT 0 0 0 0 0 0
0232827DB00163 1 4 36.88N.S. 0 0 0 0 0 0
0602828DB00035 00IGS 19860127 99.99
0612828DB00035 0 0197108002400 25.60
0202828DB00039 01GS 19860127
0202828DB00039 01GS 19860129
0602828DB00043 00IGS 19860128 99.99
0612828DB00043 0 0197511002400 4.50
0502828DB00044 01GS 19860128P
1102828DB00053 01GS 19860129
0602828DB00055 00IGS 19860129 99.99
06030258B00006 00IGS 19851015 99.99
06130258B00006 0 0197703232400 7.00
06030258B00008 00IGS 19851016 99.99
11030258B00008 01GS 19860109
11730258B00008 0 0
G 2818 BY C.G. DE BRUIJN, MARCH 1974, IGS BULLETIN 7, DEC 81

```

10 REFERENCE MANUALS

SUBJECT (MANUAL NAME)	DATE OF MANUAL	REFERENCE NUMBER
ALGOL Reference manual	Dec 1984	5011760
B7900 Systems capabilities and features	July 1984	1166170
B7900 System operator's guide	May 1985	1182151
CANDE Operations manual	Dec 1984	5014962
CANDE Reference manual	Dec 1984	5014541
COBOL ANSI-74 reference manual	Dec 1984	5014442
COBOL Language manual	Dec 1984	5001464
COMS Programmers guide (relative to MARC 3.5)	Dec 1984	1154531
Disk Subsystem software overview	May 1985	1169711
DMSII DASDL Reference manual	Nov 1984	1163805
DMSII Data dictionary reference manual	Dec 1984	1177128
DMSII Database certification software ops guide	Dec 1984	1164050
DmsII Inquiry software operation guide	Dec 1984	1164035
DMSII Inquiry reference manual	Sept 1977	5001472
DMSII Interpretive interface user's manual	Dec 1984	1163813
DMSII User language interface software ops guide	Dec 1984	5012230
DMSII Utilities and operations guide	Dec 1984	1163839
ERGO Capabilities manual	Dec 1984	1163847
ERGO User's manual	Sept 1983	1154291
I/O Subsystem reference manual	Dec 1984	5014483
LINC Help information (LINCII)		
LINC Installation and operations manual (LINCII)	JUL 1985	1163953
LINC Reference manual (LINCII)	JUL 1985	1163961
LINC Report reference manual (LINCII)	JUL 1985	1163979
MARC Manual assisted resource control user's guide	Dec 1984	1169588
System Software site management reference manual	Dec 1984	5014418
System Software support reference manual	Dec 1984	5014434
System Software utilities reference manual	Feb 1984	5014426
WFL Reference manual	Dec 1984	5011794

If you are interested in any of the above manuals, please contact your local BURROUGHS Systems services representative or the BURROUGHS logistics department in Johannesburg at (011) 442211 for more information. The following manual is available from Tecnetics at (011) 7891211.

QVT 109 Operator Manual	Sept 1984	35063
-------------------------	-----------	-------