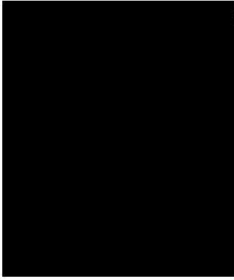


RECEIVED
APR 21 1994
CORPORATE
REMEDATION GROUP

To:



cc.



From:



Dordrecht, 19-4-1994


C8 IN GROUNDWATER SAMPLES ON DORDRECHT WORKS SITE
SAMPLES OF FEBRUARY 1994

BACKGROUND

As a part of the ongoing program to reduce the potential exposure of the community to C-8, it was decided to measure C-8 concentrations in groundwater wells on the site. This had been done in 1993, results have been reported before, and are repeated in the table below, column "C8 '93", and on map 1. The 1993 numbers were all below 3 ppb and no C-8 was found in the deeper aquifers.

The sampling program was repeated in February 1994. This time in total 14 samples were taken, all from water wells with the filter in the middle of the first aquifer. See table 1 and maps for results.

CONCLUSIONS

1. For the few points where we have data on both 1993 and 1994, we see similar or higher numbers in 1994. The increase is probably not statistically significant
2. The highest number found was 28 ppb, in a well close to the Romney Hut. Past samples of the upper sand layer in that area showed numbers of up to 230 ppb. The groundwater flow in the upper layer is towards the river, and the 230 ppb by itself was no reason to worry. However, the 28 ppb in the first aquifer shows that the vertical transport of C-8 in the ground is considerable.
3. One of the two second-highest concentrations (13 ppb) was found near the PPD-I building. This can be explained by the fact that all the groundwater streams (except the upper sand layer) are roughly in the direction South-West so the source was somewhere in Teflon or Viton/FEP, as expected.
4. The concentration variations in the horizontal plain do not show a clear profile or trend. It was attempted to explain this by the exact vertical position of the filters in the wells, but I was not able to make a consistent explanation. It is clear, however, that the bottom under our site is far from homogeneous, and local variations in bottom composition may account for irregular behaviour of sample results. This will be discussed in more details with  the groundwater specialist.

EID602554

RECOMMENDATIONS

Groundwater contamination is very hard to control. Although the current drinking water wells are in the fourth aquifer, and no C-8 has been detected there, there is a risk that long-term the C-8 will reach the fourth aquifer. This may have serious legal and/or liability consequences. The program to reduce the risks follows two tracks:

1. CONTROL SOURCES.

Various situations with large potential spills to the ground have been identified, and need to be fixed. The most conspicuous ones are:

- a. breaking sewer pipes under the Viton/FEP building
- b. overflowing sewer near Teflon wax trap
- c. old uncontrolled dumping sites for Teflon waste

I will come with proposals for item a and b, item c will be discussed in the June International C-8 meeting.

For the rest it is a matter of discipline and care. Everyone should know that no drop of C-8 should be spilled to the soil, and all C-8 should end-up in the process sewer, where it may be removed if needed.

If there are potential spill situations, spill control should be provided. This can be done with relatively small investment.

2. REMOVE PRESENT C-8 FROM GROUNDWATER

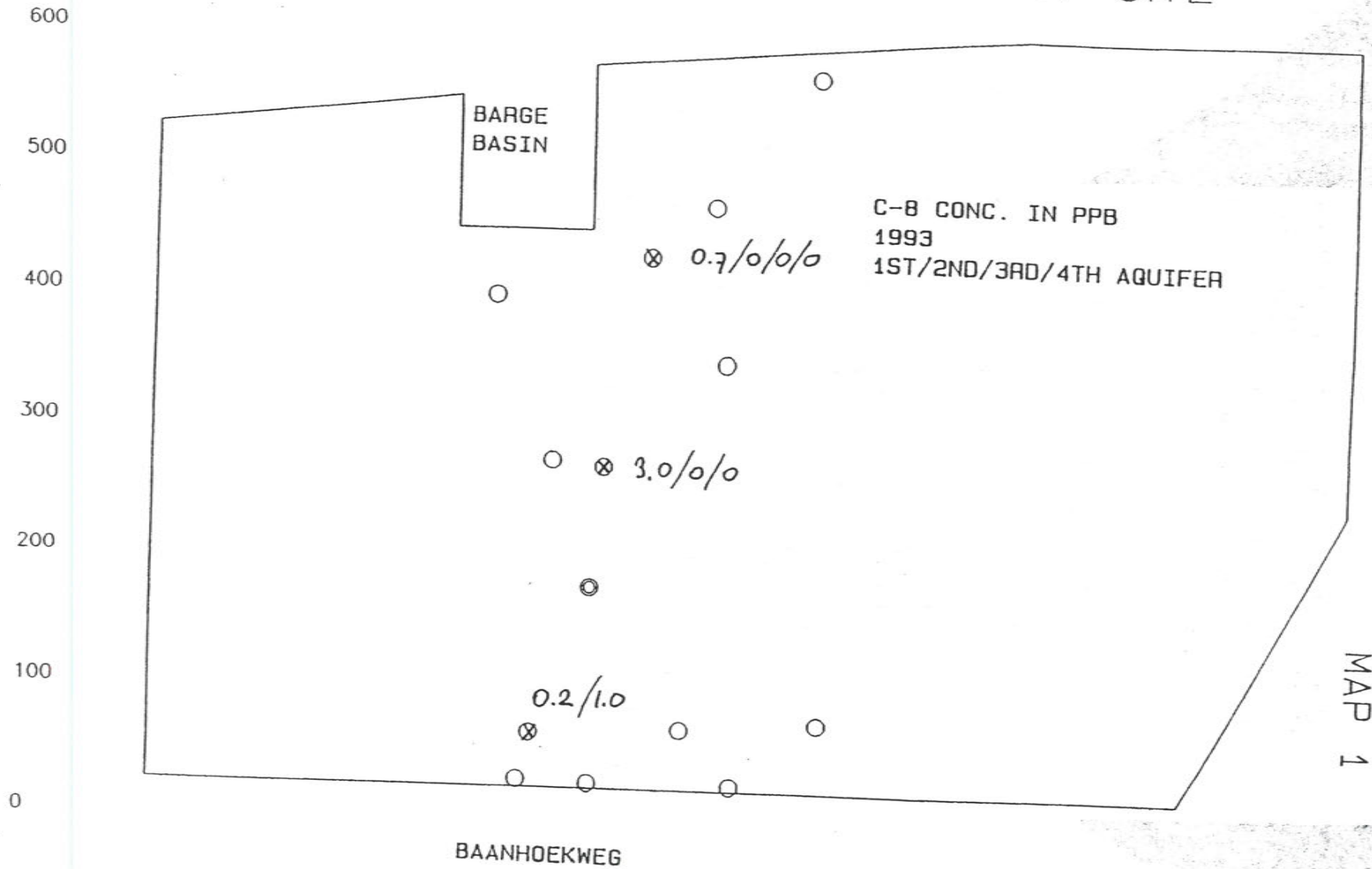
The project for containment/remediation of chlorocarbons contaminated groundwater contains a step where the water is led over a carbon contactor, before it is discharged to the river. All data indicate that this step will also remove any C-8. We will confirm this mid 1994 by taking samples before and after the treatment step. It is proposed to make C-8 control an integral routine part of the operation.

Results are shown in table 1, column "C8 '94", and on map 2. Columns in this table show viz.: LOCATION ID, EAST COORDINATE, NORTH COORDINATE, AQUIFERCODE, C-8 1994, C-8 1993, AND LOCATION DESCRIPTION. These codes correspond with the official reports by the DELFT GRONDMECHANICA company, as a part of the project to remove chlorocarbons from the groundwater.

table 1

LOC_ID	EAST	NORTH	AQFER	C8 '94 [PPB]	C8 '93 [PPB]	LOCATION
N-08-1M	1930	20	1M	0.5		Baanhoekweg
N-09-2	2040	20	1M	13		Baanhoekweg
N-13-1M	2000	70	1M	11		Centr. W.house SW
N-17-1	2010	470	1M	13		PPD-1 Oost
N-18-1	1900	280	1M	0		Delrin off.
N-19-1	2030	350	1M	0.4		Delrin Chem.
N-20-1M	1930	180	1M	0.4		Works Eng. SW
N-21-1	1860	400	1M	0.2		Delrin furn
W-2-A	2103	84	1M	3.9		Centr. W.house SE
W-3-A	1890	68	1M	0.7	0.2	Lycra South
W-3-B	1890	68	1D		1	Lycra South
W-5-A	2097	668	1M	28		Romney Hut
W-6-A	1969	426	1M		0.7	PPD-1 Zuid
W-6-B	1969	426	1D	0	0	PPD-1 Zuid
W-6-C	1969	426	2M		0	PPD-1 Zuid
W-6-D	1969	426	2D		0	PPD-1 Zuid
W-8-A	1944	275	1M		3	grndwtr bldg
W-8-B	1944	275	1D	0.6	0	grndwtr bldg
W-8-C	1944	275	2M		0	grndwtr bldg
W-9-A	1880	23	1M	0.2		Baanhoekweg

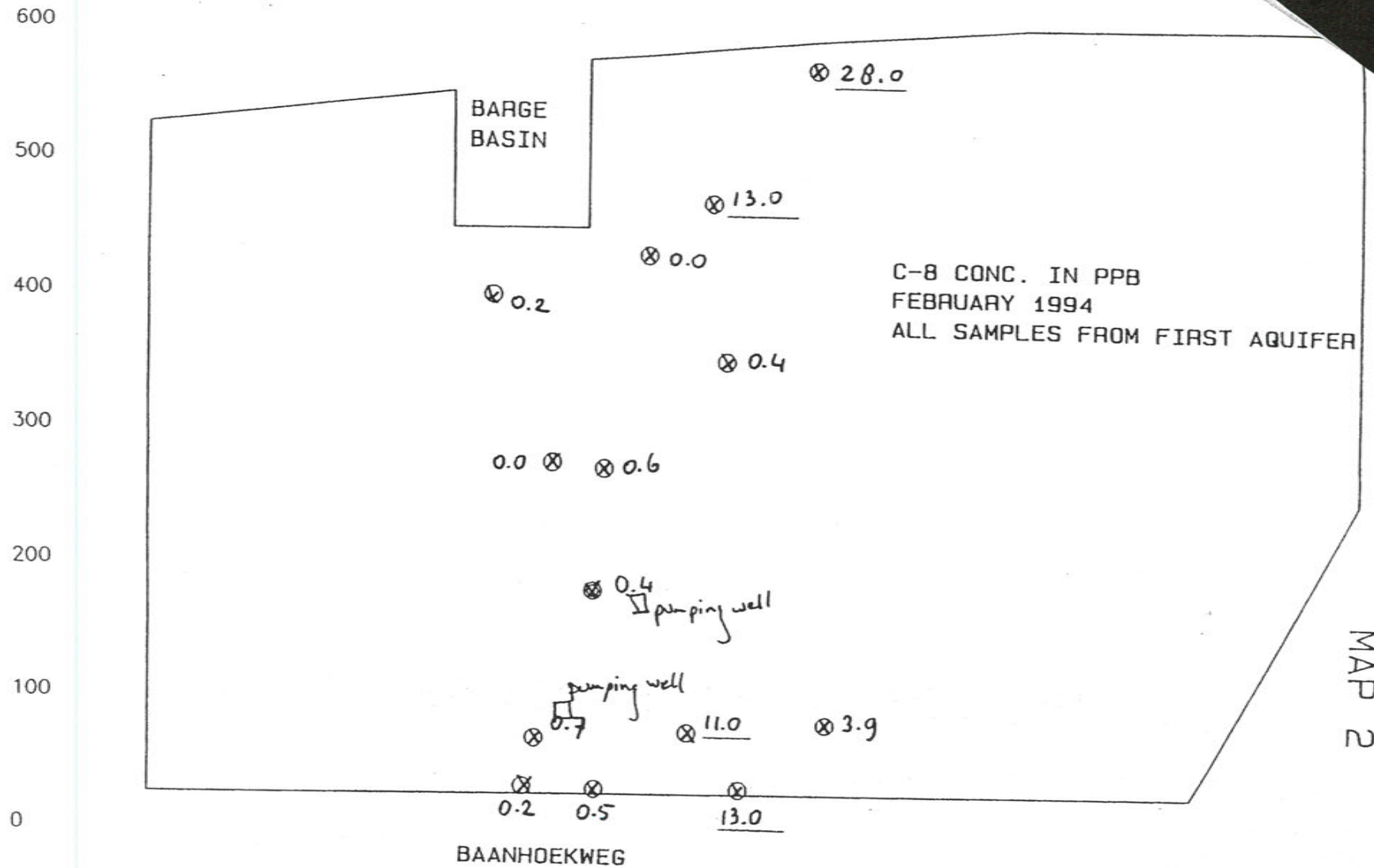
GROUNDWATER WELLS AT DUPONT SITE



EID602557

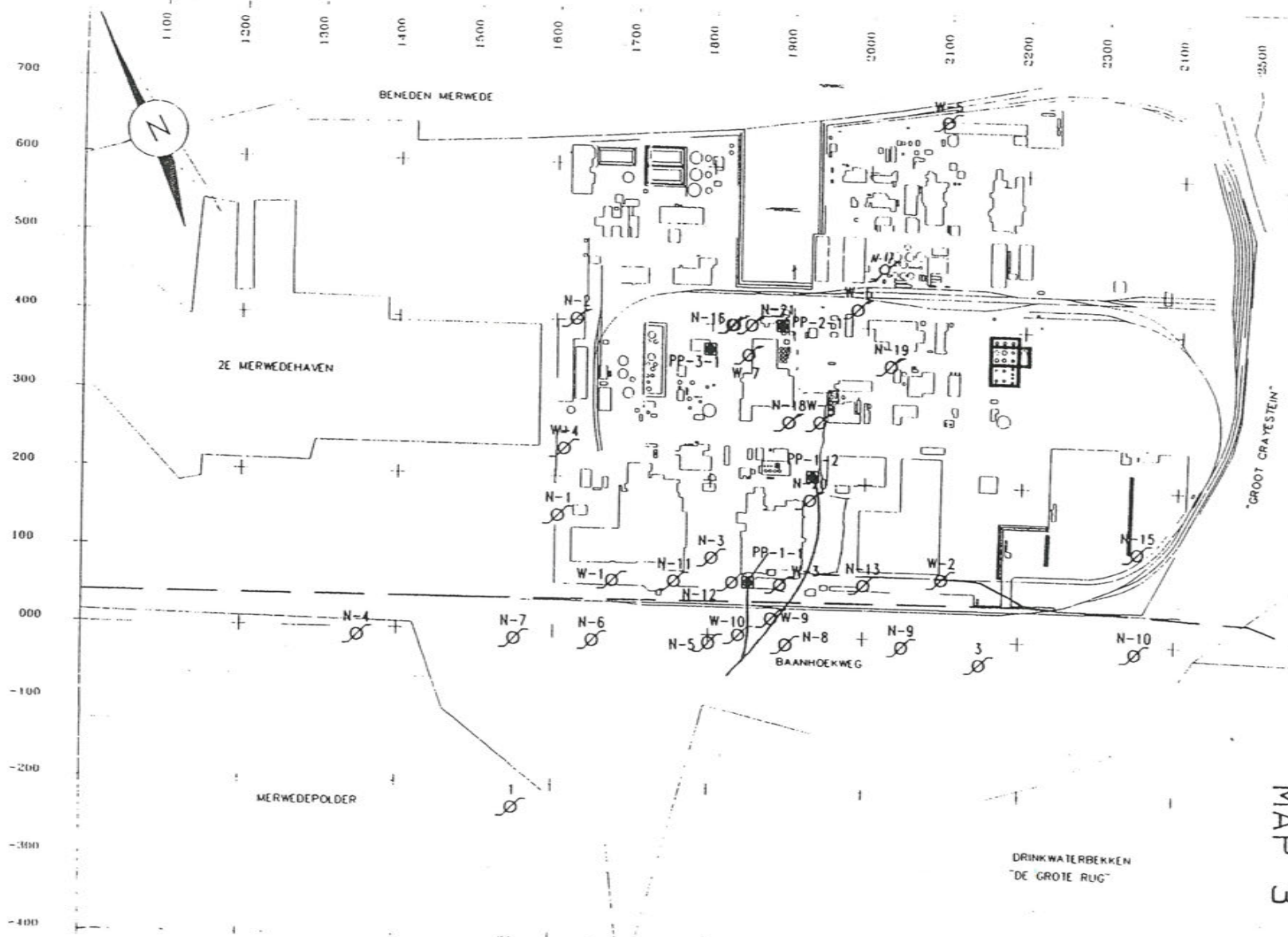
1600 1700 1800 1900 2000 2100 2200 2300

GROUNDWATER WELLS AT DUPONT SITE




MAP 2

EID602558



MAP 3


GRONDMECHANICA DELFT
 Postbus 69 2600 AB Delft
 Telefoon (015) 69 35 00
 Telefax (015) 69 35 01
 Tele. 30/34 uur 'n
**BASISONTWERP GEÏDROLOGISCH BEHEERSSTEEEM
 FABRIEKSTERREIN "DU PONT", TE DORDRECHT**
ONTWERP MEETNET FASE 1 **SCHAAL 1:5000**

'93-01-06	LUU	TECHNICA
CO-332590	30	
Bijl. 1.14	40	

- N-4 N= nieuw uit te voeren waarnemingsput
- ⊗ Waarnemingsput in de 1e waterverende laag
- ⊗ Waarnemingsput in de 2e waterverende laag
- ⊗ Waarnemingsput in de 3e waterverende laag
- ⊗ Waarnemingsput in de 4e waterverende laag
- ⊗ Waarnemingsput in de 5e waterverende laag
- ⊗ Waarnemingsput in de 6e waterverende laag
- ⊗ Waarnemingsput in de 7e waterverende laag
- ⊗ Waarnemingsput in de 8e waterverende laag
- ⊗ Waarnemingsput in de 9e waterverende laag
- ⊗ Waarnemingsput in de 10e waterverende laag
- ⊗ Waarnemingsput in de 11e waterverende laag
- ⊗ Waarnemingsput in de 12e waterverende laag
- ⊗ Waarnemingsput in de 13e waterverende laag
- ⊗ Waarnemingsput in de 14e waterverende laag
- ⊗ Waarnemingsput in de 15e waterverende laag
- ⊗ Waarnemingsput in de 16e waterverende laag
- ⊗ Waarnemingsput in de 17e waterverende laag
- ⊗ Waarnemingsput in de 18e waterverende laag
- ⊗ Waarnemingsput in de 19e waterverende laag
- ⊗ Waarnemingsput in de 20e waterverende laag
- ⊗ Waarnemingsput in de 21e waterverende laag
- ⊗ Waarnemingsput in de 22e waterverende laag
- ⊗ Waarnemingsput in de 23e waterverende laag
- ⊗ Waarnemingsput in de 24e waterverende laag
- ⊗ Waarnemingsput in de 25e waterverende laag
- ⊗ Waarnemingsput in de 26e waterverende laag
- ⊗ Waarnemingsput in de 27e waterverende laag
- ⊗ Waarnemingsput in de 28e waterverende laag
- ⊗ Waarnemingsput in de 29e waterverende laag
- ⊗ Waarnemingsput in de 30e waterverende laag
- ⊗ Waarnemingsput in de 31e waterverende laag
- ⊗ Waarnemingsput in de 32e waterverende laag
- ⊗ Waarnemingsput in de 33e waterverende laag
- ⊗ Waarnemingsput in de 34e waterverende laag
- ⊗ Waarnemingsput in de 35e waterverende laag
- ⊗ Waarnemingsput in de 36e waterverende laag
- ⊗ Waarnemingsput in de 37e waterverende laag
- ⊗ Waarnemingsput in de 38e waterverende laag
- ⊗ Waarnemingsput in de 39e waterverende laag
- ⊗ Waarnemingsput in de 40e waterverende laag
- ⊗ Waarnemingsput in de 41e waterverende laag
- ⊗ Waarnemingsput in de 42e waterverende laag
- ⊗ Waarnemingsput in de 43e waterverende laag
- ⊗ Waarnemingsput in de 44e waterverende laag
- ⊗ Waarnemingsput in de 45e waterverende laag
- ⊗ Waarnemingsput in de 46e waterverende laag
- ⊗ Waarnemingsput in de 47e waterverende laag
- ⊗ Waarnemingsput in de 48e waterverende laag
- ⊗ Waarnemingsput in de 49e waterverende laag
- ⊗ Waarnemingsput in de 50e waterverende laag
- ⊗ Waarnemingsput in de 51e waterverende laag
- ⊗ Waarnemingsput in de 52e waterverende laag
- ⊗ Waarnemingsput in de 53e waterverende laag
- ⊗ Waarnemingsput in de 54e waterverende laag
- ⊗ Waarnemingsput in de 55e waterverende laag
- ⊗ Waarnemingsput in de 56e waterverende laag
- ⊗ Waarnemingsput in de 57e waterverende laag
- ⊗ Waarnemingsput in de 58e waterverende laag
- ⊗ Waarnemingsput in de 59e waterverende laag
- ⊗ Waarnemingsput in de 60e waterverende laag
- ⊗ Waarnemingsput in de 61e waterverende laag
- ⊗ Waarnemingsput in de 62e waterverende laag
- ⊗ Waarnemingsput in de 63e waterverende laag
- ⊗ Waarnemingsput in de 64e waterverende laag
- ⊗ Waarnemingsput in de 65e waterverende laag
- ⊗ Waarnemingsput in de 66e waterverende laag
- ⊗ Waarnemingsput in de 67e waterverende laag
- ⊗ Waarnemingsput in de 68e waterverende laag
- ⊗ Waarnemingsput in de 69e waterverende laag
- ⊗ Waarnemingsput in de 70e waterverende laag
- ⊗ Waarnemingsput in de 71e waterverende laag
- ⊗ Waarnemingsput in de 72e waterverende laag
- ⊗ Waarnemingsput in de 73e waterverende laag
- ⊗ Waarnemingsput in de 74e waterverende laag
- ⊗ Waarnemingsput in de 75e waterverende laag
- ⊗ Waarnemingsput in de 76e waterverende laag
- ⊗ Waarnemingsput in de 77e waterverende laag
- ⊗ Waarnemingsput in de 78e waterverende laag
- ⊗ Waarnemingsput in de 79e waterverende laag
- ⊗ Waarnemingsput in de 80e waterverende laag
- ⊗ Waarnemingsput in de 81e waterverende laag
- ⊗ Waarnemingsput in de 82e waterverende laag
- ⊗ Waarnemingsput in de 83e waterverende laag
- ⊗ Waarnemingsput in de 84e waterverende laag
- ⊗ Waarnemingsput in de 85e waterverende laag
- ⊗ Waarnemingsput in de 86e waterverende laag
- ⊗ Waarnemingsput in de 87e waterverende laag
- ⊗ Waarnemingsput in de 88e waterverende laag
- ⊗ Waarnemingsput in de 89e waterverende laag
- ⊗ Waarnemingsput in de 90e waterverende laag
- ⊗ Waarnemingsput in de 91e waterverende laag
- ⊗ Waarnemingsput in de 92e waterverende laag
- ⊗ Waarnemingsput in de 93e waterverende laag
- ⊗ Waarnemingsput in de 94e waterverende laag
- ⊗ Waarnemingsput in de 95e waterverende laag
- ⊗ Waarnemingsput in de 96e waterverende laag
- ⊗ Waarnemingsput in de 97e waterverende laag
- ⊗ Waarnemingsput in de 98e waterverende laag
- ⊗ Waarnemingsput in de 99e waterverende laag
- ⊗ Waarnemingsput in de 100e waterverende laag

EID602559