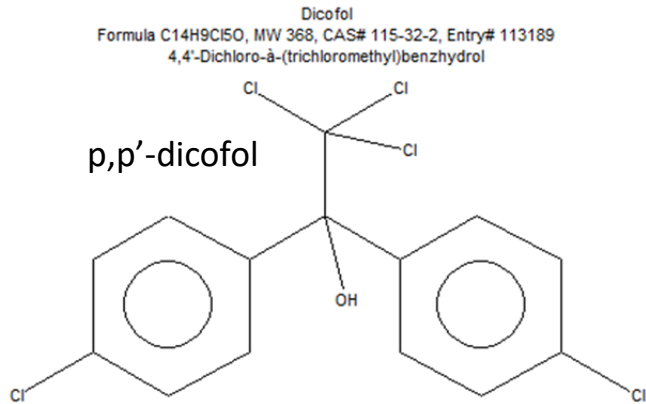


CONSERVERINGSMETHODE VOOR DICOFOL

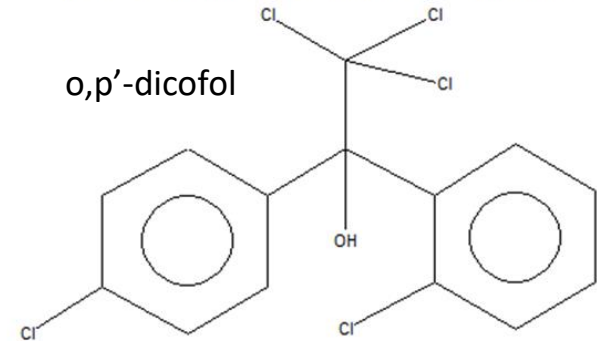
Werkgroep Water, Berchem, 16/10/2018

EIGENSCHAPPEN DICOFOL

- chloorpesticide, verwant aan DDT
- 2 isomeren, technisch mengsel is 80% p,p'-dicofol
- acaricide (bestrijding van teken en mijten)
- hoog potentieel voor bioaccumulatie (persistent)

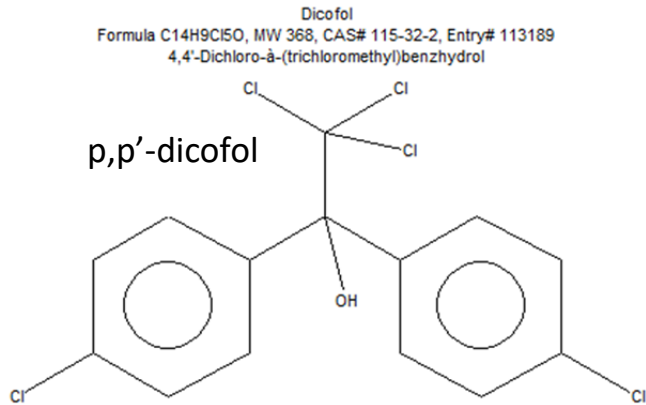


Benzenemethanol, 2-chloro-à-(4-chlorophenyl)-à-(trichloromethyl)-
Formula C₁₄H₉Cl₅O, MW 368, CAS# 10606-46-9, Entry# 113194
Benzenemethanol, 4-chloro-à-(2-chlorophenyl)-à-(trichloromethyl)-

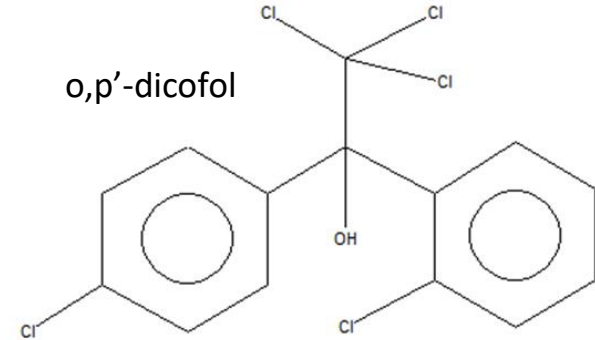


EIGENSCHAPPEN DICOFOL

- Opgenomen in de lijst van prioritaire stoffen (EU richtlijn 2008/105/EG)
- en in de lijst van 170 stoffen Vlarem II bijlage 2.3.1
- MKN 1.3 ng/L (rivieren en meren)
- Indelingscriterium AW = “rapportagegrens”



Benzenemethanol, 2-chloro-à-(4-chlorophenyl)-à-(trichloromethyl)-
Formula C₁₄H₉Cl₅O, MW 368, CAS# 10606-46-9, Entry# 113194
Benzenemethanol, 4-chloro-à-(2-chlorophenyl)-à-(trichloromethyl)-



LITERATUURDATA STABILITEIT

- dicofol breekt af in water, halfwaardetijd:
 - bij pH 9 : 10 – 25 min
 - bij pH 7 : 1 dag
 - bij pH 5: 32 dagen (o,p'-) / 149-246 dagen (p,p'-)
- o,p'-dicofol in water is gevoelig voor UV, p,p'-dicofol niet
halfwaardetijd o,p'-dicofol bij pH 5 en UV licht : 15 dagen
- dicofol degradeert snel in aceton en acetonitrile, maar is stabiel in ethanol, isopropanol, ethylacetaat en hexaan
- dicofol kan degraderen in de GC-injector, isotoopgemerkt dicofol als IS is noodzakelijk

- Conservering pesticiden (WAC/I/A/010):
 - OCP: koel en donker bewaren; 1 maand houdbaar
 - andere pesticiden: pH 6-9 met HCl of NaOH, koel en donker bewaren; OPP 1 week houdbaar, andere pesticiden 2 weken
- Onderzoek:
 - stabiliteit dicofol in OW en AW bij pH 5
 - ook stabiliteit andere OCP bij pH 5 controleren (lijst WAC/IV/A/015)
 - robuustheid: nagaan wat gebeurt indien teveel zuur toegevoegd wordt (pH2)

ROBUUSTHEID: PH2 EN PH5

- Stalen
 - OW: kanaal Dessel-Schoten
 - AW: effluent van pesticide producent
- Stalen (200 mL) op pH 2 en pH 5 gebracht met HCl
- Dopering met OCP (incl. dicofol) op concentratieniveau van 1.5 µg/L
- Staal analyseren onmiddellijk na dopering en 24u na dopering

ROBUUSTHEID: PH2 EN PH5

- Resultaten Dicofol

Oppervlaktewater	pH 5			pH 2		
	T0	T1 (24u)	T1 / T0	T0	T1 (24u)	T1 / T0
p,p'-dicofol	87%	83%	95%	94%	82%	87%
o,p'-dicofol	83%	98%	119%	85%	79%	93%

Afvalwater	pH 5			pH 2		
	T0	T1 (24u)	T1 / T0	T0	T1 (24u)	T1 / T0
p,p'-dicofol	102%	96%	94%	99%	96%	97%
o,p'-dicofol	103%	97%	94%	102%	95%	93%

Oppervlaktewater	pH 5			pH 2		
	T0	T1 (24u)	T1 / T0	T0	T1 (24u)	T1 / T0
2,3,5,6-tetraclnitrobenzeen	82%	79%	96%	88%	79%	90%
2,3,4,5-tetraclnitrobenzeen	75%	82%	109%	78%	77%	98%
alfa-HCH	106%	101%	95%	102%	99%	97%
gamma-HCH	105%	105%	100%	106%	104%	98%
bèta-HCH	104%	89%	86%	100%	94%	94%
delta-HCH	96%	94%	98%	97%	106%	110%
hexachloorbenzeen	99%	97%	98%	98%	95%	97%
pentachloornitrobenzeen	106%	94%	89%	109%	84%	77%
heptachloor	102%	85%	83%	99%	106%	107%
aldrin	92%	91%	99%	89%	91%	102%
telodrin	91%	94%	102%	99%	101%	102%
isodrin	87%	82%	95%	89%	79%	89%
alfa-heptachloorepoxide	101%	96%	95%	91%	102%	113%
bèta-heptachloorepoxide	94%	88%	93%	88%	100%	115%
cis-chloordaan	82%	86%	105%	90%	91%	101%
trans-chloordaan	96%	97%	101%	98%	96%	98%
alfa-endosulfaan	83%	64%	76%	82%	82%	101%
bèta-endosulfaan	124%	116%	93%	118%	101%	86%
endosulfansulfaat	144%	136%	95%	147%	129%	88%
dieldrin	108%	97%	90%	105%	104%	100%
endrin	76%	91%	121%	81%	84%	104%
o,p'-DDE	97%	92%	95%	95%	92%	97%
p,p'-DDE	98%	91%	93%	96%	89%	93%
o,p'-DDT	88%	84%	95%	85%	81%	96%
p,p'-DDT	84%	81%	96%	74%	75%	101%
o,p'-DDD	90%	92%	102%	90%	91%	101%
p,p'-DDD	84%	80%	95%	78%	76%	98%
methoxychloor	116%	114%	98%	114%	111%	97%

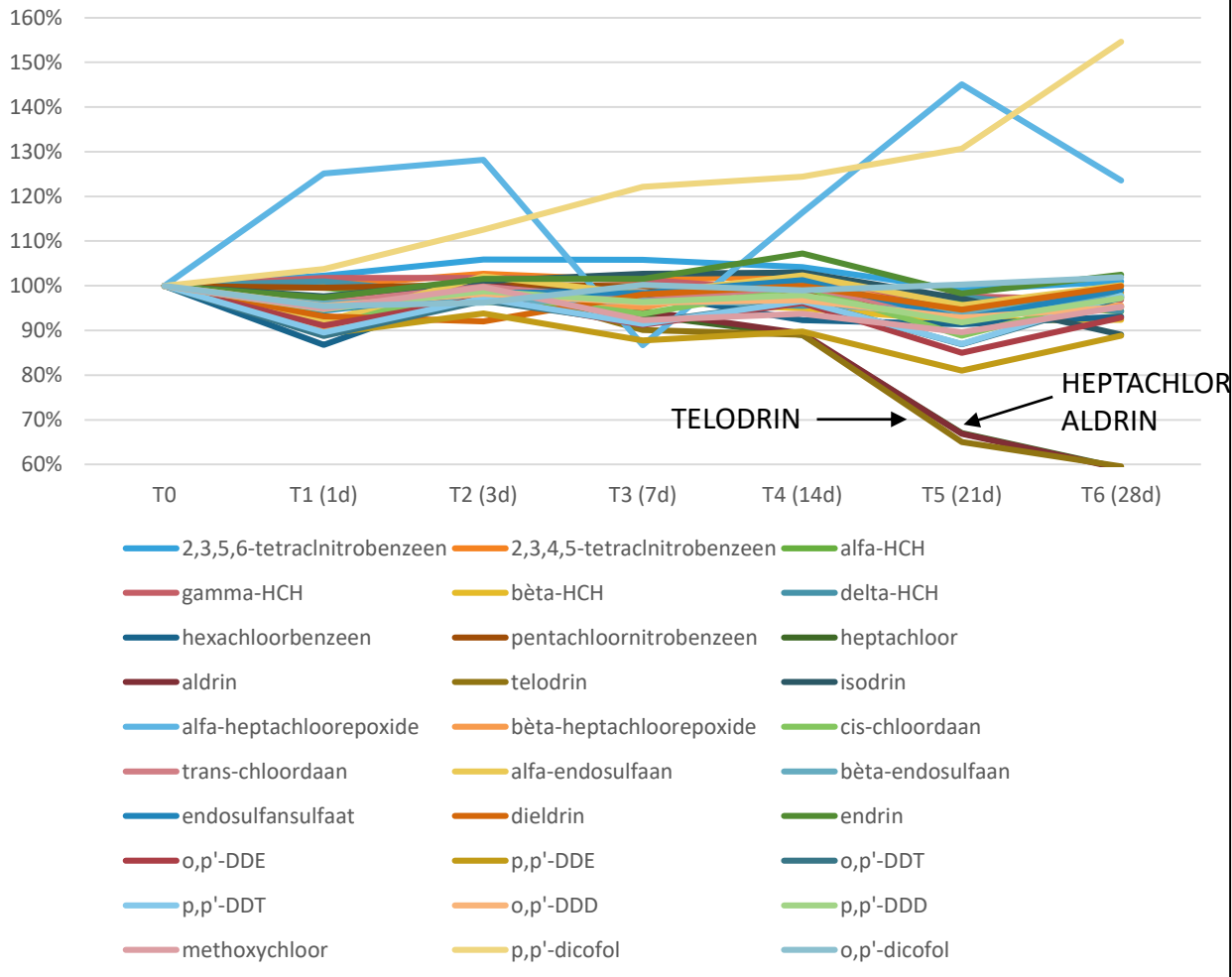
Afvalwater	pH 5			pH 2		
	T0	T1 (24u)	T1 / T0	T0	T1 (24u)	T1 / T0
2,3,5,6-tetraclnitrobenzeen	106%	110%	104%	115%	110%	96%
2,3,4,5-tetraclnitrobenzeen	89%	105%	118%	111%	103%	93%
alfa-HCH	111%	101%	90%	100%	100%	100%
gamma-HCH	117%	104%	89%	106%	108%	102%
bèta-HCH	102%	96%	94%	93%	94%	101%
delta-HCH	105%	102%	97%	97%	97%	101%
hexachloorbenzeen	112%	110%	98%	109%	106%	97%
pentachloornitrobenzeen	99%	96%	97%	105%	93%	88%
heptachloor	91%	80%	88%	79%	90%	114%
aldrin	95%	82%	86%	85%	83%	98%
telodrin	98%	91%	92%	96%	93%	97%
isodrin	100%	86%	86%	90%	86%	95%
alfa-heptachloorepoxide	85%	86%	101%	92%	84%	91%
bèta-heptachloorepoxide	99%	96%	97%	96%	95%	99%
cis-chloordaan	106%	99%	93%	103%	102%	99%
trans-chloordaan	113%	106%	93%	111%	106%	95%
alfa-endosulfaan	111%	98%	88%	94%	104%	111%
bèta-endosulfaan	111%	92%	83%	90%	87%	98%
endosulfansulfaat	145%	149%	103%	151%	145%	95%
dieldrin	107%	104%	97%	113%	101%	89%
endrin	79%	80%	102%	77%	74%	96%
o,p'-DDE	107%	92%	86%	105%	94%	89%
p,p'-DDE	105%	91%	86%	107%	97%	91%
o,p'-DDT	97%	101%	104%	109%	98%	90%
p,p'-DDT	103%	103%	100%	114%	107%	93%
o,p'-DDD	99%	99%	99%	106%	97%	92%
p,p'-DDD	110%	107%	97%	112%	113%	101%
methoxychlor	111%	106%	96%	111%	108%	98%

STABILITEIT: PROEFOPZET

- Stalen
 - OW: kanaal Dessel-Schoten
 - AW: effluent van pesticide producent
- Stalen (200 mL) op pH 5 gebracht met HCl
- Dopering op 2 concentratieniveau's
 - Laag: 50 ng/L per OCP
 - Hoog: 0,5 µg/L per OCP
- Bewaartermijn: 1 dag, 3 dagen, 1 week, 2 weken, 3 weken, 4 weken
- Referentie (100%) = staal onmiddellijk geanalyseerd na dopering

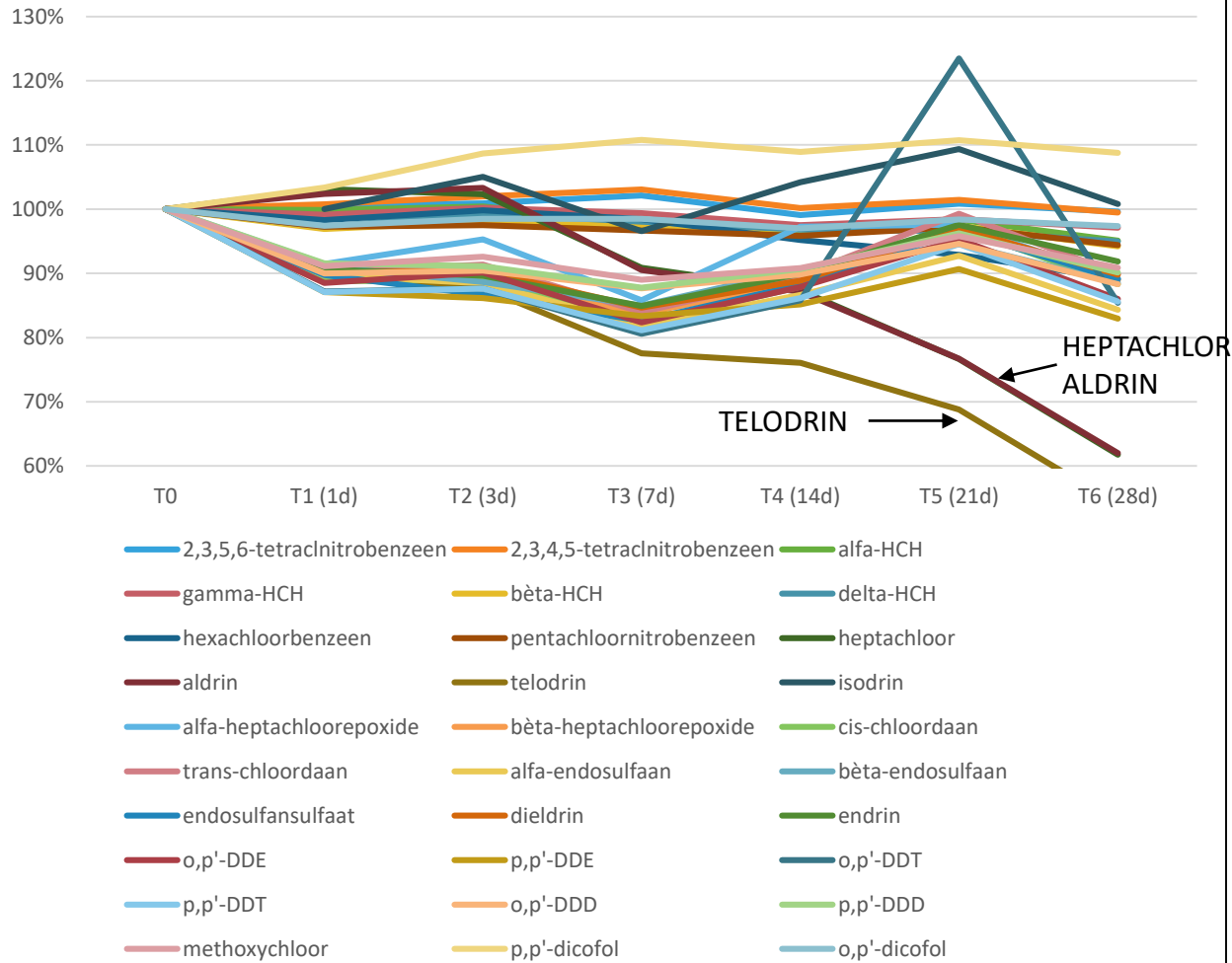
OPPERVLAKTEWATER 0,05 µg/L	T0	T1 (1d)	T2 (3d)	T3 (7d)	T4 (14d)	T5 (21d)	T6 (28d)
2,3,5,6-tetraclnitrobenzeen	100%	102%	106%	106%	104%	99%	101%
2,3,4,5-tetraclnitrobenzeen	100%	100%	103%	101%	102%	96%	98%
alfa-HCH	100%	100%	96%	98%	96%	97%	94%
gamma-HCH	100%	102%	102%	101%	99%	98%	97%
bèta-HCH	100%	97%	99%	97%	95%	92%	92%
delta-HCH	100%	101%	98%	97%	95%	98%	94%
hexachloorbenzeen	100%	87%	100%	98%	92%	91%	93%
pentachloornitrobenzeen	100%	100%	100%	100%	98%	94%	95%
heptachloor	100%	95%	101%	93%	89%	67%	59%
aldrin	100%	96%	101%	94%	89%	67%	59%
telodrin	100%	91%	100%	90%	89%	65%	60%
isodrin	100%	98%	101%	103%	103%	97%	89%
alfa-heptachloorepoxide	100%	125%	128%	87%	116%	145%	124%
bèta-heptachloorepoxide	100%	91%	98%	95%	101%	93%	96%
cis-chloordaan	100%	92%	98%	94%	100%	89%	98%
trans-chloordaan	100%	96%	100%	97%	100%	92%	97%
alfa-endosulfaan	100%	92%	102%	98%	102%	96%	100%
bèta-endosulfaan	100%	96%	97%	97%	96%	94%	98%
endosulfansulfaat	100%	94%	99%	98%	101%	93%	99%
dieldrin	100%	93%	92%	98%	100%	95%	100%
endrin	100%	97%	102%	102%	107%	98%	103%
o,p'-DDE	100%	91%	97%	91%	96%	85%	93%
p,p'-DDE	100%	89%	94%	88%	90%	81%	89%
o,p'-DDT	100%	89%	97%	92%	97%	87%	97%
p,p'-DDT	100%	90%	97%	91%	97%	87%	98%
o,p'-DDD	100%	96%	98%	96%	97%	93%	95%
p,p'-DDD	100%	95%	99%	96%	98%	92%	97%
methoxychloor	100%	95%	100%	92%	94%	90%	95%
p,p'-dicofol	100%	104%	113%	122%	124%	131%	155%
o,p'-dicofol	100%	95%	96%	100%	99%	100%	102%

Oppervlaktewater 0,05 µg/L

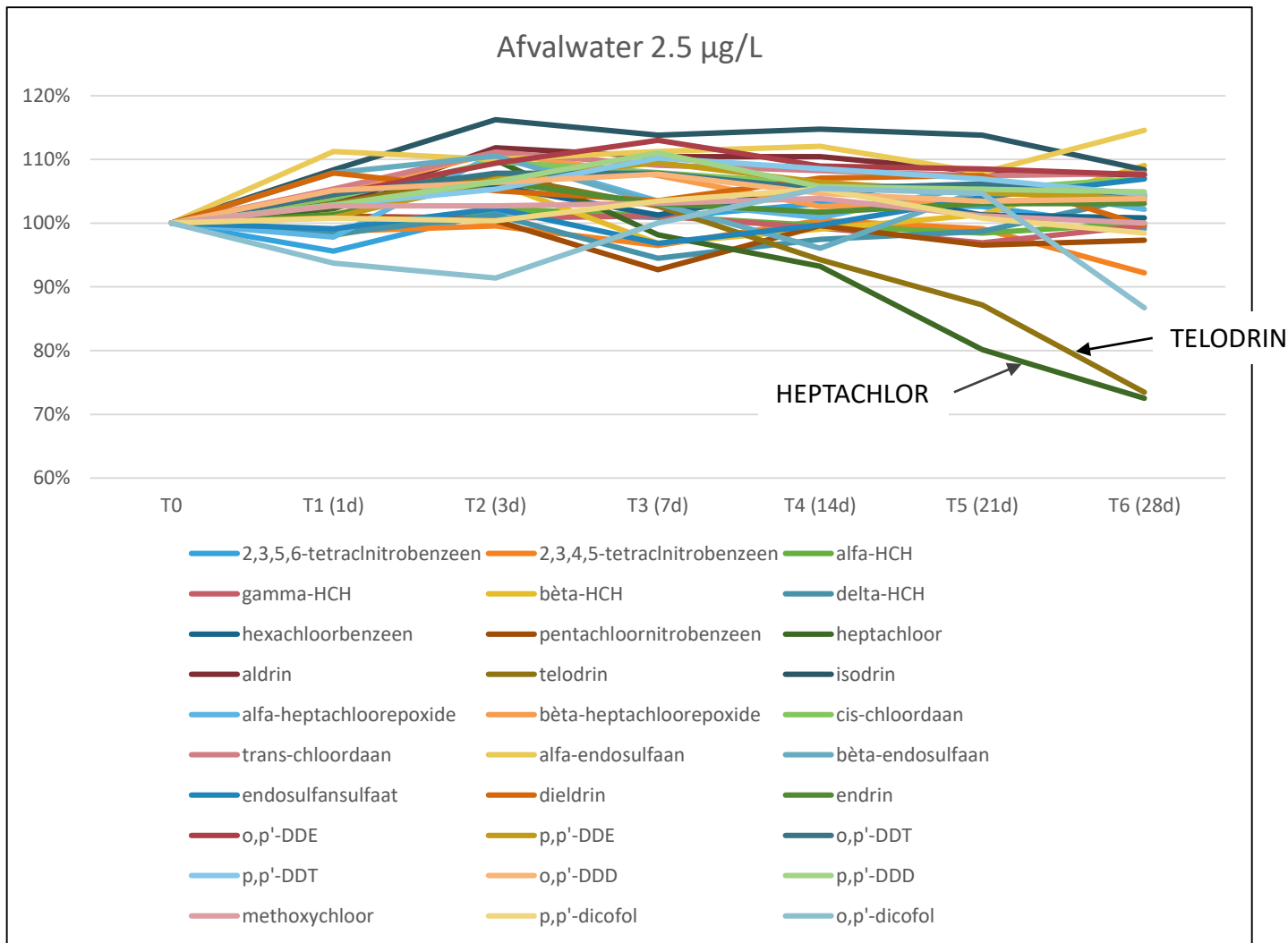


OPPERVLAKTEWATER 0,5 µg/L	T0	T1 (1d)	T2 (3d)	T3 (7d)	T4 (14d)	T5 (21d)	T6 (28d)
2,3,5,6-tetraclnitrobenzeen	100%	100%	101%	102%	99%	101%	100%
2,3,4,5-tetraclnitrobenzeen	100%	101%	102%	103%	100%	101%	99%
alfa-HCH	100%	100%	100%	98%	96%	98%	95%
gamma-HCH	100%	99%	100%	99%	98%	98%	97%
bèta-HCH	100%	97%	98%	97%	97%	97%	94%
delta-HCH	100%	97%	99%	98%	97%	97%	95%
hexachloorbenzeen	100%	98%	100%	98%	95%	93%	89%
pentachloornitrobenzeen	100%	97%	98%	97%	96%	97%	94%
heptachloor	100%	103%	102%	91%	87%	77%	62%
aldrin	100%	102%	103%	91%	87%	77%	62%
telodrin	100%	89%	88%	78%	76%	69%	54%
isodrin		100%	105%	97%	104%	109%	101%
alfa-heptachloorepoxide	100%	91%	95%	86%	97%	98%	89%
bèta-heptachloorepoxide	100%	89%	89%	84%	89%	97%	89%
cis-chloordaan	100%	89%	89%	82%	88%	97%	88%
trans-chloordaan	100%	90%	91%	84%	90%	99%	90%
alfa-endosulfaan	100%	90%	88%	82%	87%	93%	84%
bèta-endosulfaan	100%	91%	89%	85%	91%	95%	89%
endosulfansulfaat	100%	90%	87%	83%	88%	97%	89%
dieldrin	100%	90%	90%	85%	89%	97%	90%
endrin	100%	91%	90%	85%	90%	98%	92%
o,p'-DDE	100%	89%	90%	82%	88%	95%	86%
p,p'-DDE	100%	87%	86%	83%	85%	91%	83%
o,p'-DDT	100%	87%	88%	81%	86%	123%	85%
p,p'-DDT	100%	87%	88%	81%	86%	95%	86%
o,p'-DDD	100%	90%	90%	88%	90%	95%	88%
p,p'-DDD	100%	92%	91%	88%	91%	96%	90%
methoxychloor	100%	91%	93%	89%	91%	96%	91%
p,p'-dicofol	100%	103%	109%	111%	109%	111%	109%
o,p'-dicofol	100%	97%	98%	98%	97%	98%	97%

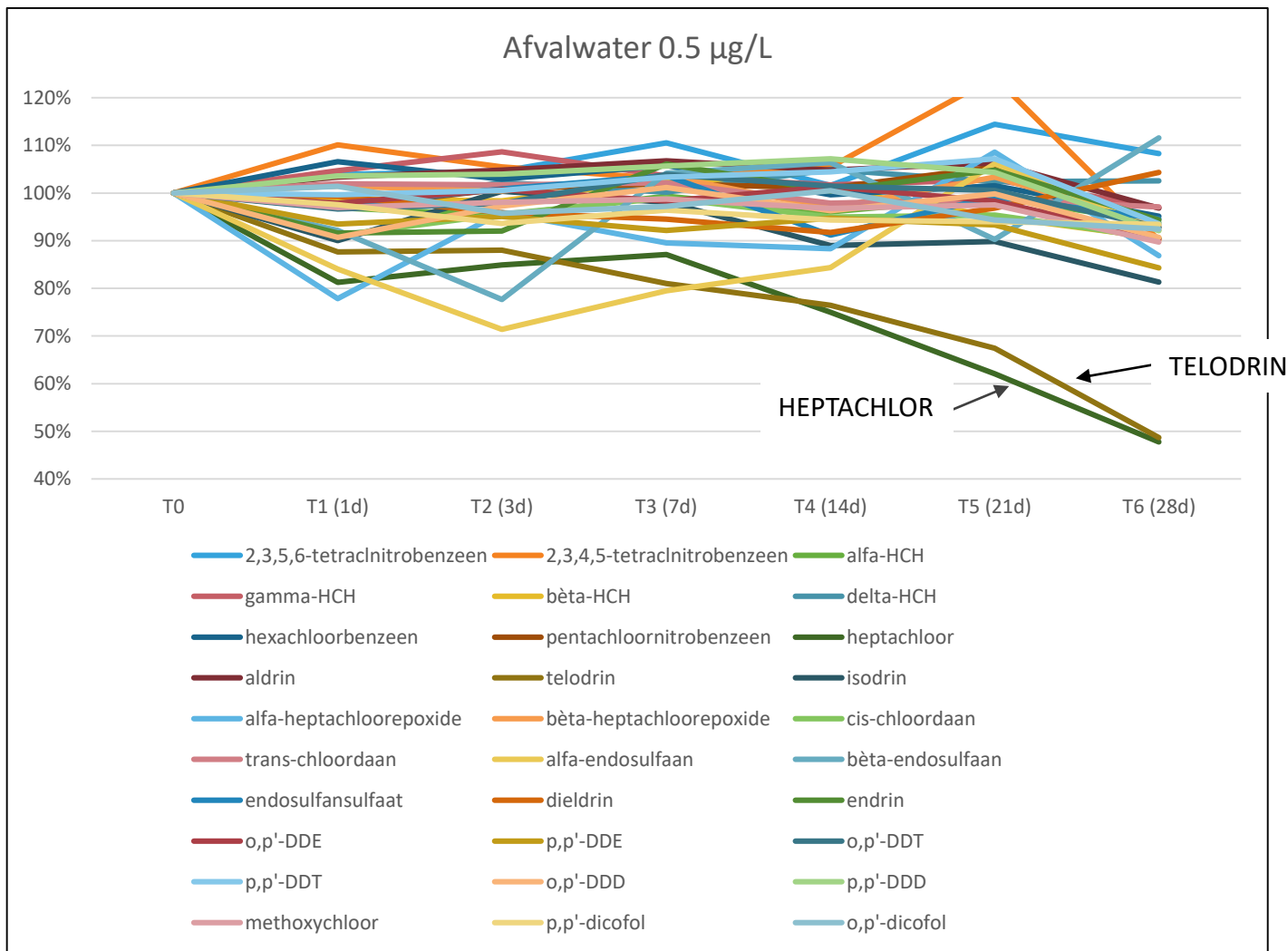
Oppervlaktewater 0,5 µg/L



AFVALWATER 2.5 µg/L	T0	T1 (1d)	T2 (3d)	T3 (7d)	T4 (14d)	T5 (21d)	T6 (28d)
2,3,5,6-tetraclnitrobenzeen	100%	96%	102%	101%	103%	103%	99%
2,3,4,5-tetraclnitrobenzeen	100%	99%	100%	97%	100%	99%	92%
alfa-HCH	100%	98%	102%	101%	100%	98%	100%
gamma-HCH	100%	101%	101%	101%	99%	97%	100%
bèta-HCH	100%	101%	106%	97%	99%	101%	109%
delta-HCH	100%	98%	101%	94%	97%	99%	104%
hexachloorbenzeen	100%	104%	106%	101%	106%	101%	101%
pentachloornitrobenzeen	100%	101%	100%	93%	100%	97%	97%
heptachloor	100%	102%	110%	98%	93%	80%	73%
aldrin	100%	103%	112%	110%	110%	108%	108%
telodrin	100%	103%	108%	103%	94%	87%	73%
isodrin	100%	108%	116%	114%	115%	114%	108%
alfa-heptachloorepoxide	100%	98%	111%	103%	101%	106%	102%
bèta-heptachloorepoxide	100%	105%	111%	107%	103%	104%	104%
cis-chlooraan	100%	104%	110%	108%	106%	105%	107%
trans-chlooraan	100%	105%	111%	109%	108%	107%	108%
alfa-endosulfaan	100%	111%	110%	111%	112%	108%	115%
bèta-endosulfaan	100%	108%	111%	103%	96%	105%	104%
endosulfansulfaat	100%	99%	102%	97%	100%	104%	107%
dieldrin	100%	108%	105%	104%	107%	107%	100%
endrin	100%	101%	107%	103%	102%	103%	103%
o,p'-DDE	100%	104%	109%	113%	109%	109%	108%
p,p'-DDE	100%	101%	107%	109%	106%	105%	104%
o,p'-DDT	100%	105%	108%	108%	105%	106%	105%
p,p'-DDT	100%	103%	105%	110%	109%	107%	104%
o,p'-DDD	100%	105%	106%	108%	105%	103%	104%
p,p'-DDD	100%	103%	107%	111%	106%	105%	105%
methoxychloor	100%	103%	103%	103%	104%	101%	100%
p,p'-dicofol	100%	101%	100%	103%	105%	101%	98%
o,p'-dicofol	100%	94%	91%	100%	105%	105%	87%



AFVALWATER 0,5 µg/L	T0	T1 (1d)	T2 (3d)	T3 (7d)	T4 (14d)	T5 (21d)	T6 (28d)
2,3,5,6-tetraclnitrobenzeen	100%	104%	105%	111%	102%	114%	108%
2,3,4,5-tetraclnitrobenzeen	100%	110%	105%	103%	105%	124%	90%
alfa-HCH	100%	97%	95%	99%	96%	99%	94%
gamma-HCH	100%	105%	109%	104%	102%	103%	97%
bèta-HCH	100%	99%	98%	103%	101%	95%	91%
delta-HCH	100%	97%	102%	100%	105%	102%	103%
hexachloorbenzeen	100%	107%	103%	106%	100%	102%	95%
pentachloornitrobenzeen	100%	97%	101%	102%	101%	105%	93%
heptachloor	100%	81%	85%	87%	75%	62%	48%
aldrin	100%	103%	105%	107%	105%	106%	97%
telodrin	100%	88%	88%	81%	76%	67%	49%
isodrin	100%	90%	100%	98%	89%	90%	81%
alfa-heptachloorepoxide	100%	78%	96%	90%	88%	109%	87%
bèta-heptachloorepoxide	100%	101%	100%	104%	97%	103%	93%
cis-chlooraan	100%	91%	96%	99%	95%	95%	91%
trans-chlooraan	100%	102%	102%	102%	98%	99%	97%
alfa-endosulfaan	100%	84%	71%	80%	84%	106%	92%
bèta-endosulfaan	100%	92%	78%	104%	106%	90%	112%
endosulfansulfaat	100%	97%	101%	104%	91%	99%	95%
dieldrin	100%	99%	96%	95%	92%	97%	104%
endrin	100%	92%	92%	106%	100%	105%	94%
o,p'-DDE	100%	98%	101%	98%	101%	98%	90%
p,p'-DDE	100%	94%	95%	92%	95%	93%	84%
o,p'-DDT	100%	97%	98%	104%	101%	101%	93%
p,p'-DDT	100%	100%	101%	103%	104%	107%	94%
o,p'-DDD	100%	91%	97%	101%	96%	100%	91%
p,p'-DDD	100%	104%	104%	106%	107%	104%	92%
methoxychloor	100%	97%	98%	99%	97%	98%	90%
p,p'-dicofol	100%	98%	94%	96%	94%	94%	93%
o,p'-dicofol	100%	101%	96%	97%	100%	94%	92%



VOORLOPIG BESLUIT

- OCP (incl dicofol) conserveren op pH 5
- Maximale houdbaarheid bedraagt 7 dagen