

*Ljutomerčan d.o.o.*

Ljutomerčan d.o.o.  
Babinska cesta 4  
9240 LJUTOMER

# OCENA MOŽNOSTI ONESNAŽENJA TAL IN PODZEMNE VODE, Farma Cven

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(sprememba OVD IED)

Domžale, december 2023, dopolnitev: junij 2024

## OCENA MOŽNOSTI ONESNAŽENJATAL IN PODZEMNE VODE

Domžale, december 2023, dopolnitev: junij 2024

Upravljavlec:	Ljutomerčan d.o.o. Babinska cesta 4 9240 LJUTOMER
Naprava:	Farma Cven
Lokacija:	Cven, občina Ljutomer
Projekt:	Ocena možnosti onesnaženja tal in podzemne vode
Izdelovalec:	IPSUM, okoljske investicije, d.o.o.
Številka projekta:	102-386/OM0/23
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### **Priloga 1:**

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### **Priloga 2:**

Dokazila o biorazgradljivosti sestavnih komponent **dezinfekcijskega sredstva PROPHYL® S**

### **Priloga 3:**

Dokazila o biorazgradljivosti sestavnih komponent **dezinfekcijskega sredstva Virocid™**



## 1 PODATKI O UPRAVLJAVCU

### 1.1 NAZIV POSEGA IN NJEGOV NAMEN

**Naziv posega:** Sprememba OVD IED Farme Cven.

**Namen posega:** Investitor je zgradil nov hlev za rejo plemenskih svinj.

**V obstoječem stanju ima Farma Cven okoljevarstveno dovoljenje (št. 35407-100/2006-14, z dne 29. 1. 2009) za obratovanje naprave za intenzivno rejo prašičev pitancev (teža nad 30 kg) s proizvodno zmogljivostjo 9.500 mest. Naprava sestoji iz 9 objektov za rejo, pomožnih objektov in upravne stavbe.**

Nosilec nameravanega posega je v zadnjih letih porušil sedem obstoječih objektov za rejo na Farmi Cven in zgradil nov hlev za plemenske svinje. V novem hlevu je 846 mest za plemenske svinje.

Na zemljišču parc. št. 192 k.o. Cven (velikost zemljišča znaša 36.969 m<sup>2</sup>), kjer se nahaja obstoječa farma, trenutno reja živali poteka le v hlevu: Hlev 5 in Hlev nova vzreja, ki sta obnovljena.

Letos (2023) je bil zgrajen še nov hlev za plemenske svinje (N1 in N2) s skupnim številom mest 846, zato je to naprava IED.

Na območju se nahaja še objekt upravne stavbe, manjše skladišče za kadavre, skladišče in vodarna pri vhodu, ter manjši nadstrešek na SV delu območja farme. Na skrajnem južnem delu območja pa je še 6 obstoječih betonskih lagun za zbiranje gnojnice (SkRO1-6), skupne kapacitete 10.200 m<sup>3</sup>, kar zadošča predvideni kapaciteti živali.

### 1.2 PODATKI O UPRAVLJAVCU

Investitor gradnje in upravljavec, ki bo upravljal z zgrajenimi objekti je podjetje Ljutomerčan d.o.o., Babinska cesta 4, 9240 Ljutomer.

## **2 NAMEN IN PRAVNI OKVIR OCENE MOŽNOSTI ONESNAŽENJA TAL IN PODZEMNE VODE**

Zakon o varstvu okolja (ZVO-2) (Uradni list RS, št. 44/22, 18/23 – ZDU-1O in 78/23 – ZUNPEOVE) v 112. členu določa, da če obratovanje »naprave, ki lahko povzroča onesnaževanje večjega obsega« (Industrial Emissions Directive - IED; v nadaljevanju: IED naprava) vključuje uporabo, proizvodnjo ali emisijo določene nevarne snovi, ki lahko povzroči onesnaženje tal ali podzemne vode (zadevne nevarne snovi) na območju IED naprave, mora vloga za pridobitev okoljevarstvenega dovoljenja vsebovati tudi »izhodiščno poročilo« (v nadaljevanju: IP).

Podrobnejša vsebina IP in merila za določitev zadevne nevarne snovi so predpisana v Uredbi o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22), (v nadaljevanju: Uredba IED). Omenjena uredba zahteva od vseh upravljavcev IED naprav, da pripravijo »Ocene možnosti onesnaženja tal in podzemne vode« (v nadaljevanju: OMO), ki je osnova za odločitev ali je potrebno izdelati tudi IP.

Ocena možnosti onesnaženja tal in podzemne vode (OMO) tvorijo prva tri poglavja izhodiščnega poročila. OMO obsega:

1. Opredelitev nevarnih snovi, ki se skladiščijo, uporabljajo, proizvajajo v IED napravi ali izpuščajo na območju IED naprave zaradi opravljanja IED dejavnosti in njihove lastnosti.
2. Opredelitev zadevnih nevarnih snovi.
3. Ugotovitve in opis možnosti onesnaženja tal in podzemne vode z zadevnimi nevarnimi snovmi s priloženim poročilom o pregledu tehničnih ukrepov za preprečevanje onesnaženja tal in podzemne vode.

Pri pripravi OMO in IP se upošteva najmanj naslednje predpise:

- Uredba o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22),
- Uredbo o stanju podzemnih voda (Ur. l. RS, št. 25/09, 68/12, 66/16 in 44/22 – ZVO-2),
- Pravilnik o obratovalnem monitoringu stanja podzemne vode (Ur. l. RS, št. 13/21 in 44/22 – ZVO-2)
- Pravilnik o obratovalnem monitoringu stanja tal (Ur. l. RS, št. 157/22 in 7/23 – popr.)

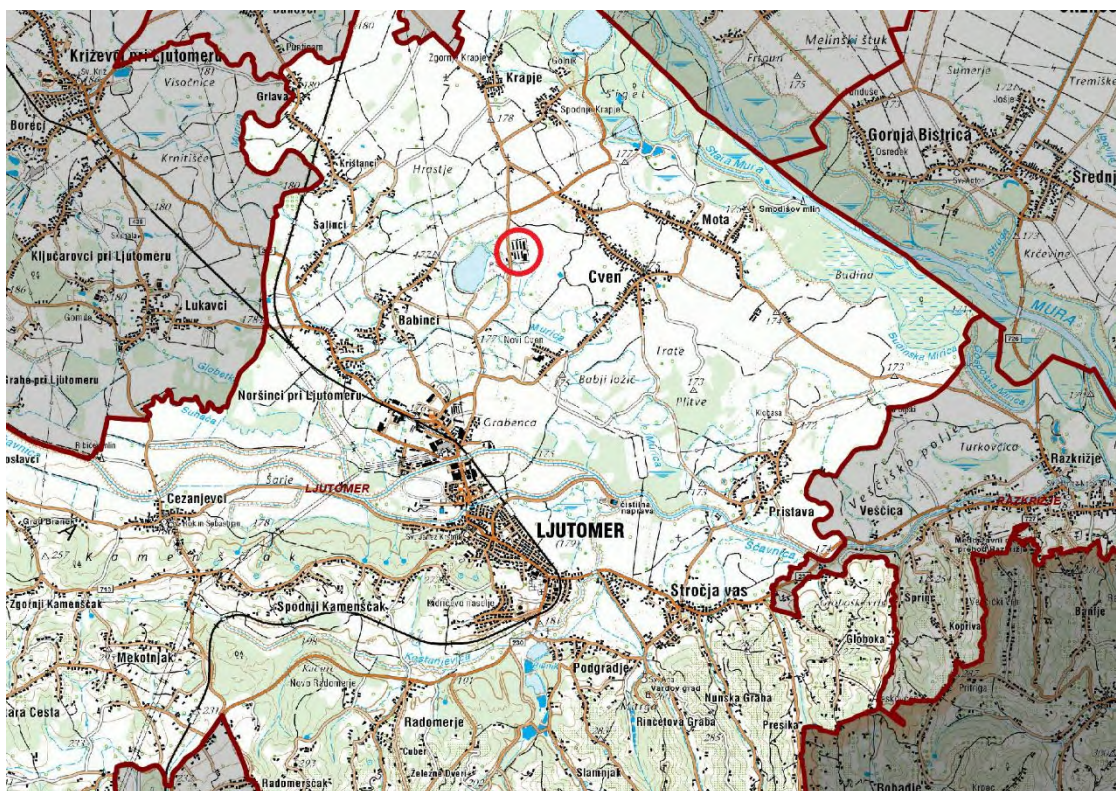
Ocena možnosti onesnaženja tal in podzemne vode (OMO), je izdelana skladno z Navodilom za pripravo Ocene možnosti onesnaženja tal in podzemne vode, MOP, julij 2022.

## 3 OPIS IN ZNAČILNOSTI POSEGA

### 3.1 LOKACIJA, VELIKOST, ZMOGLJIVOST IN OBSEG POSEGA

#### 3.1.1 Območje posega

Območje posega se nahaja v ravninskem svetu občine Ljutomer v naselju Cven, tik ob gramoznici Babinci. V neposredni bližini ni stanovanjskih naselij, najbližje naselje (Cven) se nahaja približno 700 vzhodno od območja posega. Širša in ožja lokacija posega sta prikazani na spodnjih slikah.



**Slika 1:** Območje Farme Cven v širšem geografskem območju  
(vir: gis.iobcina.si, december 2023)





**Slika 2:** Ožje območje posega (območje posega označeno z rdečo)  
(vir: gis.iobcina.si, december 2023)

#### 3.1.1.1 Seznam obravnavanih parcel

##### **Seznam zemljišč za nameravano gradnjo:**

- **k.o. 241 Cven: 192**, skupne površine 36.969 m<sup>2</sup>.

#### **3.1.2 Zmogljivost in obseg posega**

Obstoječa Farma obsega dva obstoječa hleva, ki sta bila že obnovljena ter nov hlev za plemenske svinje zgrajen v letu 2023.

Zmogljivost novega hleva bo omogočala rejo 846 plemenskih svinj.
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## **3.2 LASTNOSTI POSEGA**

### **3.2.1 Tehnične in tehnološke značilnosti posega**

#### 3.2.1.1 Osnovni koncept farme

Glavni proizvodni proces na farmi bo vzreja plemenskih svinj, tekačev in prašičev pitancev.

Na zemljišču parc. št. 192 k.o. Cven (velikost zemljišča znaša 36.969 m<sup>2</sup>) stoji obstoječa farma, ki je delno obnovljena. Na območju trenutno obratujeta dva obnovljena in tehnološko posodobljena objekta in sicer:

- **objekt »Hlev 5«**  
gre za obstoječ objekt, v katerem je 432 mest za pitance do 110 kg in 880 mest za tekače. Pitanci so razdeljeni v 18 boksov, med tem ko so tekači razporejeni v 48 boksov. Bruto tlorisna površina objekta znaša 941 m<sup>2</sup>.
- **objekt »Hlev – nova vzreja«**  
obstoječ objekt, predviden za obnovo, v katerem je 3.520 mest za tekače in bodo razdeljeni v 8 oddelkov. V vsakem oddelku bo nastanjenih 440 tekačev. Bruto tlorisna površina objekta znaša 1.721 m<sup>2</sup>.

V tem letu 2023, je bil na mestu starih dotrajanih hlevov, zgrajen nov hlev za plemenske svinje PL1 za 846 mest. Nahaja sem med upravno stavbo na zahodni strani in zahodno od zgoraj navedenih dveh obstoječih hlevov (hlev 5 in Hlev – nova vzreja), kjer poteka v Hlevu 5 vzreja pitancev in tekačev, ter v Hlevu – nova vzreja, kjer poteka vzreja zgolj tekačev.

Vsi hlevi so povezani na kanalizacijski sistem za odvajanje odpadnih voda s šestimi obstoječimi betonskimi lagunami na skrajni južni meji območja farme.

#### **Opis novega objekta – hlev PL1 (IED naprava)**

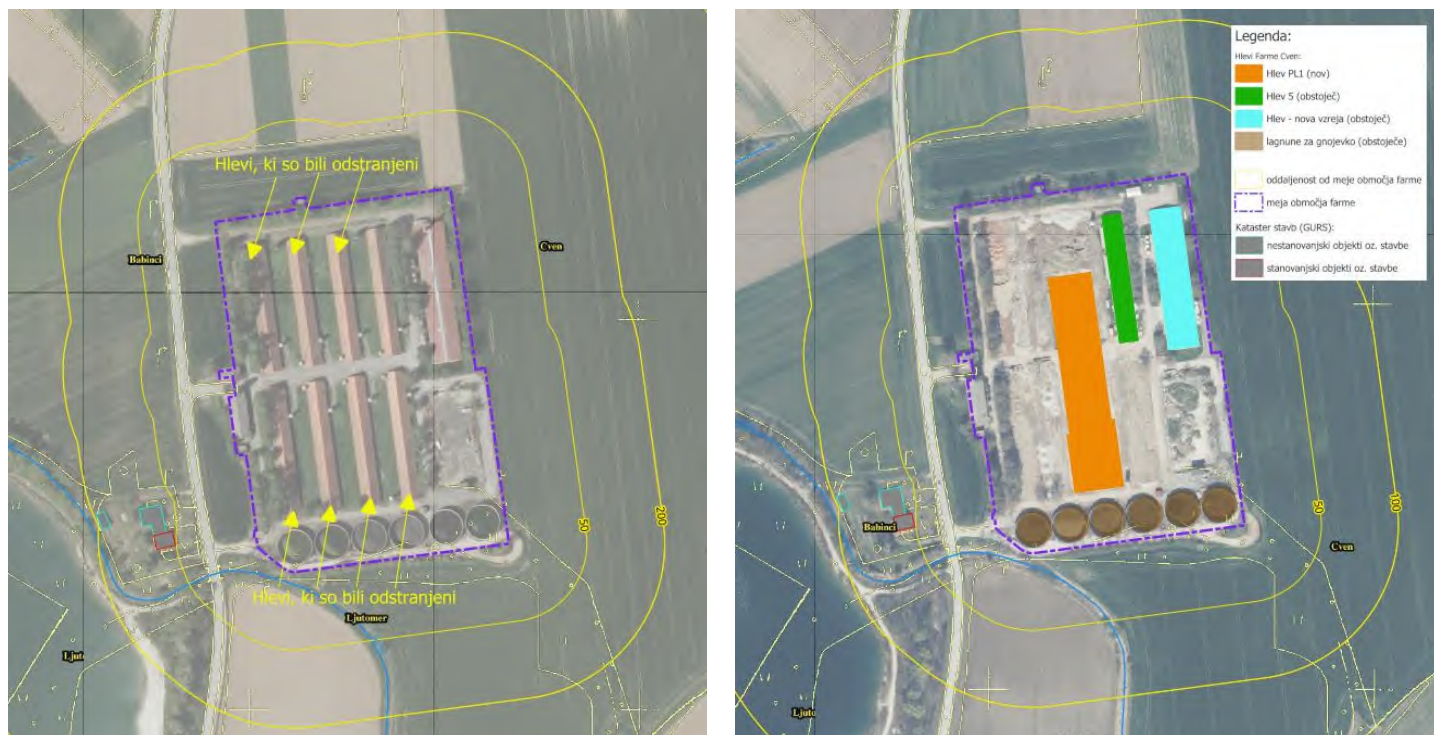
Objekt je zasnovan kot kombinacija AB montažne gradnje ter AB monolitne gradnje. Temeljenje objekta je na AB točkovnih in pasovnih temeljih. Talna konstrukcija so AB kanali, nad katerimi so hlevske tipske rešetke. Osnovna konstrukcija je delno AB montažna konstrukcija, delno so zidane stene, na katere nalegaj AB montažni strešni nosilci. Tlorisna velikost objekta je 27,00m x 139,60m + 2,40m x 49,75m + 2,40m x 37,90m + 2,5m x 4,40m, skupaj bruto tlorisna površina 3.980,90 m<sup>2</sup>, etažnost je pritlična. Streha je zasnovana kot simetrično dvokapna streha, v naklonu 8°. Fasada in strešna kritina je pločevinasti sendvič panel s toplotno izolacijo.

Novi hlev PL1 je razdeljen na dva dela, (hlev je razdeljen oddelek za svinje za pripust in breje svinje ter na oddelek za svinje v laktaciji, kjer so prisotni še pujski do 7 kg), skupna kapaciteta 846 živali – plemenskih svinj (pujski do 7 kg niso všteti).

Na območju farme Cven se ob vhodu nahaja objekt, ki deloma služi za skladišče (**Sk2**) in deloma za vodnjak – vrtina, kjer je izdano vodno dovoljenje (št. stavbe 127), upravna stavba (št. stavbe 138), manjši objekt hladilnice za kadavre **SkO1** (št. stavbe 190) ter 2 obstoječa hleva (št. stavbe 99 in 98), to sta "Hlev 5" - **N4** in hlev "Nova vzreja" - **N3**.

Na območju farme se nahaja še hladilnica za kadavre, ki služi kot začasno skladišče za kadavre, do odvoza kadavrov, s strani veterinarske službe.

Situacija farme Cven, z novim objektom hleva je prikazana na spodnji sliki.



**Slika 3:** Prikaz stanja na Farmi Cven pred (levo) in po spremembi (desno)

## **SKLADIŠČENJE GNOJEVKE TER ODPADNIH VODA**

V proizvodnem procesu glede na to, da večinski del reje živali poteka na rešetkastih tleh brez nastilja, nastaja **gnojevka**, ki se zbira v bazenih pod hlevi. Ta se po kanalizaciji steka v betonske lagune (SkRO1-6), kjer se skladišči do odvoza na kmetijske površine.

Glede na to, da farma deluje v zelo zmanjšani obliki glede na število živali in prvotno potrebo po skladiščenju gnojevke, so tako potrebe za skladiščenje več kot dovolj. Kapaciteta vseh lagun je namreč 10.200 m<sup>3</sup>. Vsaka laguna je dimenzij notranjega premera 21 m, višine 4 m ter prostornine max. 1.700 m<sup>3</sup>.

Za potrebe skladiščenja nastale gnojevke, investitor razpolaga s šestimi (6) lagunami, s skupno prostornino 10.200 m<sup>3</sup> (to je max. Volumen, ki pa nikoli ni dosežen, saj se lagune polnijo do 2/3 volumna). Iz preračuna izhaja, da bi farma potrebovala v skladu z zakonodajo, prostor za ca. 3.806 m<sup>3</sup> gnojevke za polletno obdobje.

Na območju farme bodo nastajale še pralne odpadne vode, ki nastajajo pri čiščenju hlevov. Ocenjena skupna letna količina te odpadne vode je ca. 3.000 m<sup>3</sup>. Pranje hlevov se opravlja z visokotlačnimi črpalkami. Voda od čiščenja prostorov v hlevih se prav tako steka v bazene pod hlevi in od tu preko kanalizacije v betonske lagune.

Nekaj malega gnoja nastaja na delih tal v hlevu, kjer ni rešetkastih tal. Tam se kot nastilj uporablja žagovina. To je prostor, kjer so svinje z mladiči in deloma pri tekačih. Na leto nastaja do ene prikolicice gnoja. Gnoj je na kovinski prikolicici, ki je vodotesna, pokrit s folijo. Odpelje se ga na kmetijske površine kot gnojilo.

Investitor razpolaga s 488 ha obdelovalnih površin, ki so primerna za raztros gnojevke. Celotna evidenca raztrosa se vodi v Gnojilnih načrtih. Količina gnojevke je ocenjena na 7.612 m<sup>3</sup>/leto, za celotno farmo. Skupna obremenitev kmetijskih zemljišč na kmetijskem gospodarstvu, pri gnojenju z živinskimi gnojili, katera ostanejo na kmetijskem gospodarstvu znaša ca. 83 kg N/ha letnega vnosa živinskega N (ob upoštevanju, da je izračun za obremenitev 40.902 N/kg), kar je daleč pod dovoljenim pragom iz zgoraj navedene Uredbe.

### 3.3 OPIS STANJA TAL

#### 3.3.1.1 Geološka zgradba

Širše območje posega se je geomorfološko oblikovalo v obdobju pleistocen-holocen. V srednjem in zgornjem pleistocenu je bilo širše območje zasipano z ogromnimi količinami puhlice, ki se je danes ohranila v posameznih erozijskih ostankih na ozemlju Slovenskih goric. V interglacialnem obdobju sta reki Mura in Drava odnašali prod in pesek s planina metamorfnih masivov Vzhodnih Alp, ki je sedaj deponiran v dolinah omenjenih rek. Glede na podatke Osnovne Geološke karte Slovenije (GeoZS) se na tem območju nahaja tudi območje posega. Farma Cven se glede na lego v prostoru nahaja na območju Murskega polja na območju Murske ravnine. Murska ravan je ravninska obmejna pokrajina, ki jo obdajajo vinorodna gričevja in je prekrita s kvartarnimi kamninami. Mursko polje, veliko okoli 100 km<sup>2</sup>, se deli na Zgornje in Spodnje Mursko polje. Sestavljajo ga trije večji deli, in sicer:

- mladopleistocenska ilovnata terasa, ki se razprostira na zahodu, vzdolž Slovenskih goric
- holocenska peščeno-ilovnata terasa ob Ščavnici
- holocenski vršaj iz proda in peska, ki leži med spodnjim tokom Ščavnice in Muro in ga sekajo številni stari rokavi Mure (npr. Murica, Sirotkina in Kozarica)

#### 3.3.1.2 Pedološka zgradba

Na nastanek prsti na Murski ravnini je odločilno vplivala Mura, ki se je cepila v rokave, premeščala strugo od severa proti jugu in za sabo puščala različno stare prodne in peščene nanose, ki so se mešali s peščenimi, ilovnatimi in glinastimi nanosi s sosednjih gričevij. Na Murskem polju je najbolj pogosta srednje globoka in globoka ilovnata prst, ki leži na holocenski peščeni naplavinini med Veržejem in Križevci ter Krapjem in Cvenom. Ob starem vijugastem toku Murice, ki se nahaja južno od območja Farme Cven je tudi neoglejena in oglejena ilovato-meljasta prst. Obe sta rahli, sposobni zadržati vlago in zato zelo primerni za poljedelstvo. Glede na podatke Pedološke karte Slovenije (MKGP, 2007) se na območju posega nahajajo razvita obrečna tla, ki so značilna za srednje in nižje dele vodotokov. Tla so običajno sveža in dobro preskrbljena z rastlinskimi hranili. Podrobneje se na območju posega nahajajo naslednji tipi tal: obrečna tla, evtrična, zmerno oglejena, na ilovnatem aluviju (60%) in obrečna tla, evtrična, globoko oglejena, na ilovnatem aluviju (40%). Efektivna poljska kapaciteta tal je velika in znaša od 151 do 230 mm.

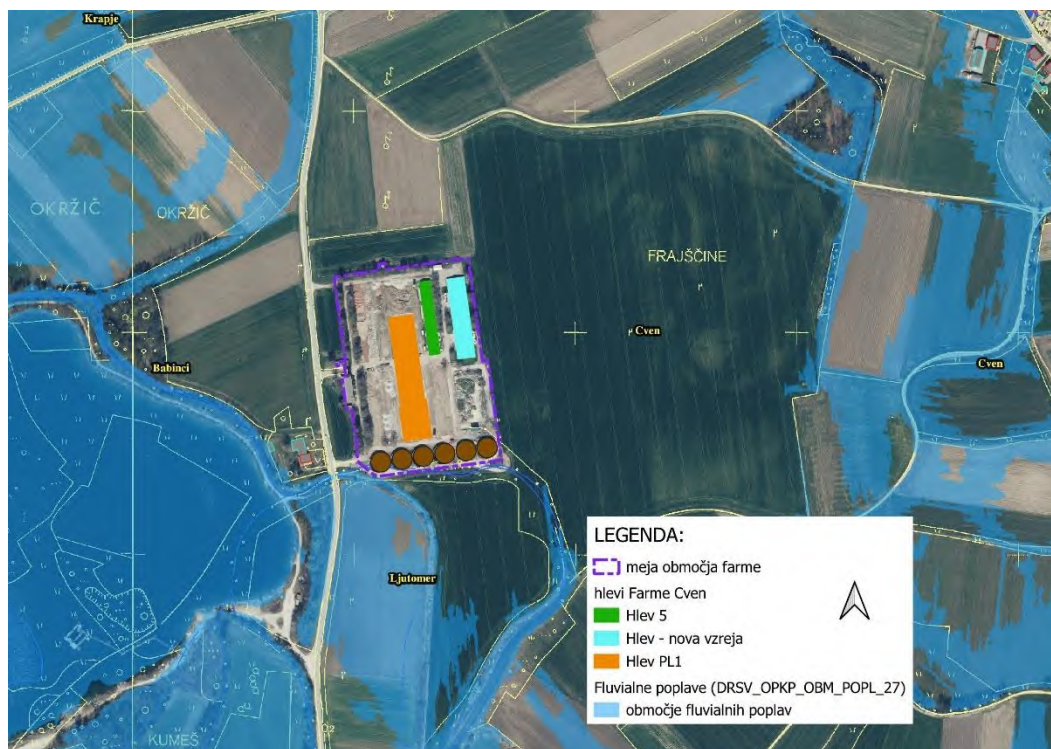
#### 3.3.1.3 Erozija in plazljivost tal

Območje farme Cven se nahaja izven vseh razredov poplavne nevarnosti. Erozijska in plazljiva območja se v ravninskem delu doline reke Ščavnice ne pojavljajo. Erozijska in plazovita območja v Občini Ljutomer se pojavljajo v južnem gričevnatem območju občine.



### 3.3.2 Poplavne površine

Območje farme Cven se nahaja izven vseh razredov poplavne nevarnosti. Prav tako se območje ne nahaja na območjih, ki so bila modelirana na podlagi 2D modela (fluvialne in pluvialne poplave), kot je razvidno iz spodnje slike.



**Slika 4:** Prikaz območja posega in poplavnih površin  
(vir: ARSO, december 2023)

### 3.3.3 Vodovarstvena območja

Nameravani poseg se ne nahaja na vodovarstvenem območju. Najbližje vodovarstveno območje se nahaja približno 1,8 km SV od območja posega.





**Slika 5:** Prikaz območja posega (rdeča obroba) in vodovarstvenih območij  
(vir: ARSO, Atlas okolja)

### 3.3.4 Degradirana in druga območja

Na lokaciji posega poteka kmetijska dejavnost, z njo je povezana tudi raba prostora. Območje posega obkrožajo najboljša kmetijska zemljišča. Na območju posega in njegovi bližnji in širši okolici ni degradiranih območij.

Prav tako se v neposredni bližini nahaja območje, po namenski rabi Površine nadzemnega pridobivalnega prostora (LN), v naravi gramoznica Babinci.

## 3.4 KRATEK OPIS IED NAPRAVE IN PROIZVODNEGA PROCESA

Glavni proizvodni proces na farmi bo vzreja plemenskih svinj, tekačev in prašičev pitancev.

Trenutno sta na kmetijskem gospodarstvu dva delujoča hleva (Hlev 5 in Hlev Nova vzreja), kjer poteka vzreja tekačev (4.400 mest) in prašičev pitancev (432 mest).

Farma predvideva rejo plemenskih svinj v novo zgrajenem hlevu (IED naprava), kjer bo 846 mest za plemenske svinje. Ostala dva hleva (povezani napravi) bosta prav tako nadaljevala z rejo živali.

Na farmi bo v novem **hlevu PL1 - A1** (tehnoški enoti **N1 in N2**) prostora za največ 846 plemenskih svinj. Hlev je razdeljen na dva dela, (hlev je razdeljen oddelek za svinje za pripust in breje svinje ter na oddelek za svinje v laktaciji, kjer so prisotni še pujski do 7 kg), skupna kapaciteta 846 živali – plemenskih svinj (pujski do 7 kg niso všteti).

Plemenske svinje so nastanjene v več oddelkih v hlevih. Ti oddelki so **pripustišče, čakališče ter prasilišče**.

Odstavljene pujske se nato iz prasilišča, ko dosežejo ciljno težo vsaj 7 kg, prestavi v oddelek **vzrejališča** (hlev 5 – N3 ali hlev Nova vzreja – N4). V tem oddelku poteka vzreja tekačev, to je pujsov z začetno težo vsaj 7 kg in končno težo 30 kg. Tekachi so potomci plemenskih svinj na farmi. Vzreja tekačev bo potekala v samostojnih hlevih oziroma oddelkih znotraj hleva. Uhlevljanje poteka tedensko, živali pa so v vzreji približno 5-6 tednov oziroma do prirasta na težo živali največ do 30 kg (običajno do teže 25-28 kg). Tekache se oblikuje v skupine, pri čemer se združi po spolu ter primerljivi teži. Čas vzreje tekačev v vzrejališču je nekje do 8 tednov. Po tem času in ko dosežejo ciljno težo, to je 30 kg, se tekače prestavi v **pitališče**. Tukaj ne govorimo več o tekačih, pač pa gre za pitance. Njihovo uhlevljanje poteka približno 4 mesece. Ta faza vzreje je zadnja faza vzreje pujsov. Pujsi so združeni v večje skupine glede na težo in spol. Povprečna dolžina vzreje pitancev v tem oddelku je 3,5 do 4 mesece. Povprečna teža pitancev je od 75 kg do 110 kg žive teže. S tem je en turnus vzreje prašičev od sesnih pujskov do končne teže pitancev zaključen.

Na spodnjih dveh slikah so prikazane nepremične tehnološke enote IED naprave (A1):

N1 – hlev PL1 svinje za pripust in breje svinje – čakališče in pripustišče

N2 – hlev PL1 svinje v laktaciji – prasilišče

N9 – kurilna naprava (hlev PL1)

N10 – kurilna naprava (hlev PL1)

N11 – kurilna naprava (hlev PL1)

N12 – diesel agregat

Kakor tudi tehnološke enote povezanih naprav.

**Naprave B1 in B2** (druge povezane naprave)

N4 – hlev 5 (s Sil3 in Sil4) (ni del IED naprave)

N3 – hlev "Nova vzreja" (ni del IED naprave)

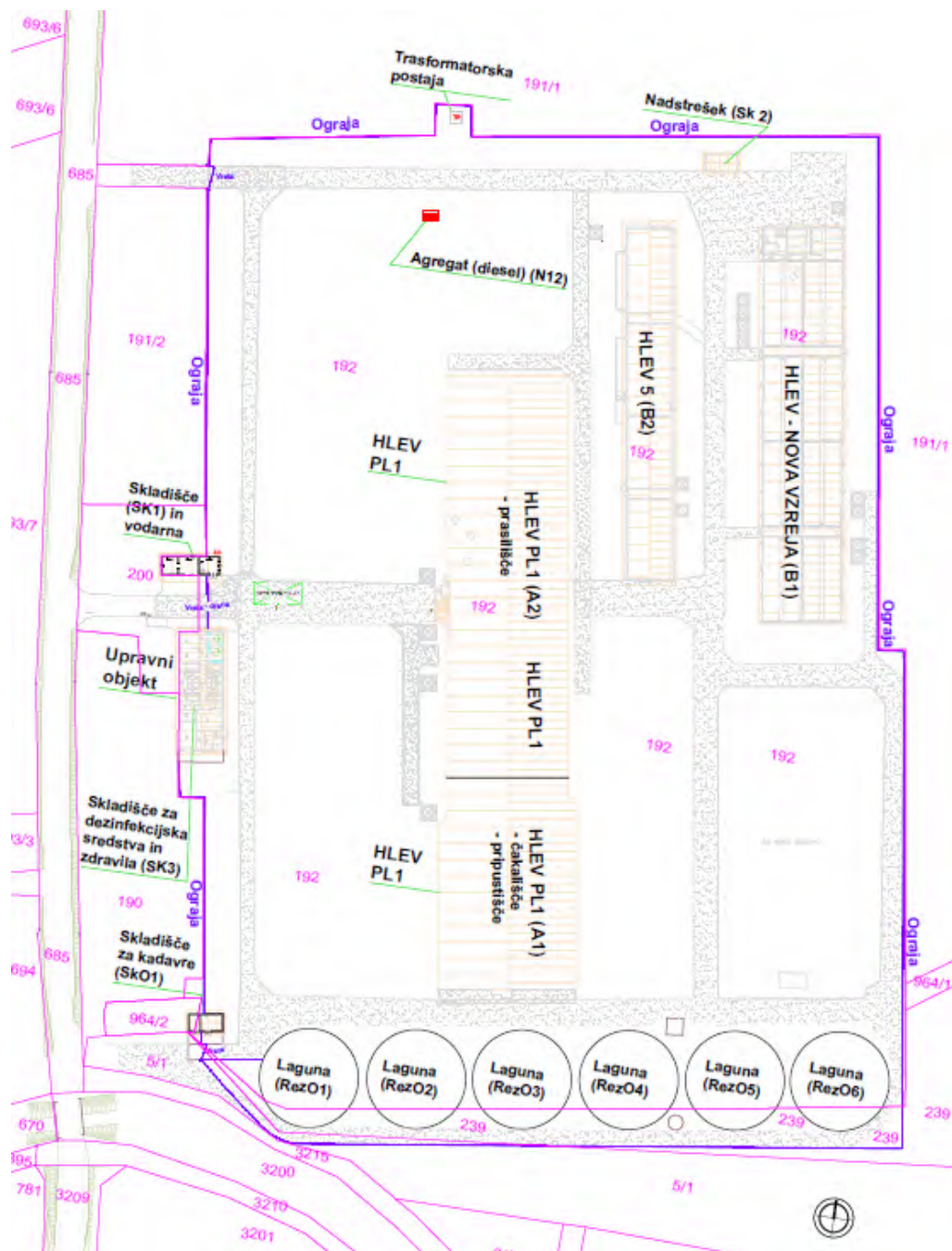
Na napravi B1 (N3) in B2 (N4), so še sledeče tehnološke enote:

N5 – kurilna naprava (N4, hlev 5)

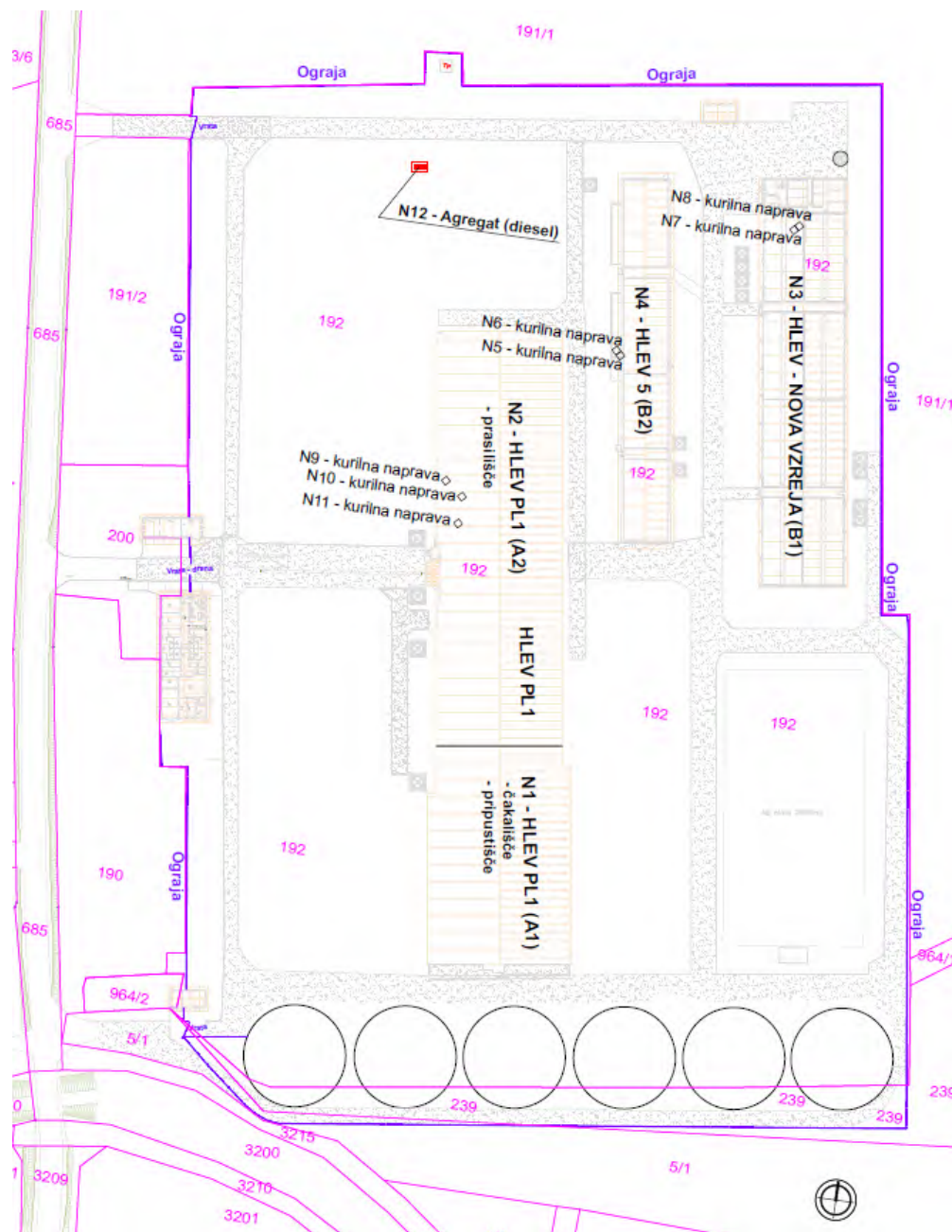
N6 – kurilna naprava (N4, hlev 5)

N7 – kurilna naprava (N3, hlev nova vzreja)

N8 – kurilna naprava (N3, hlev nova vzreja)



Slika 6: Shematski prikaz objektov na območju IED naprave



**Slika 7:** Shematski prikaz tehnoloških enot na območju IED naprave, vključno s povezanimi napravami

## Skladiščenje, raba surovin in energentov

V proizvodnem procesu intenzivne reje **plemenskih svinj**, tekačev in pitancev se porabljajo oz. nastajajo:

- **Surovine**

- **Krma (peleti, drobljenec)** – v silosih **SkS1 – SkS3 (Sil1 – Sil16)** in v big bag vrečah 500 kg ter v 30 kg vrečah v objektu pri vhodu na farmo **Sk1**
- **Voda**, se ne skladišči, pridobiva se iz lastne vrtine (Vodno dovoljenje št. 35536-52/2011) in direktno iz javnega vodovodnega omrežja.

- **Pomožni material**

- **Slama** – kot zaposlitveni material za živali, v skladu z načeli za dobrobit živali (skladiščijo se bale slame) – **Sk2**
- **Lesena polena**, kot zaposlitveni material za živali, v skladu z načeli za dobrobit živali (skladiščijo se bale slame) – **Sk2**
- **Žagovina**, (deloma za nastilj v hlevu Nova vzreja - tekači) se skladišči na traktorski prikolici, ki se nahaja pod nadstreškom, na severni strani parcele, z oznako **Sk2**
- Dezinfekcijska sredstva (manjše skladišče v upravni stavbi) – **Sk3** – **skladišče za dezinfekcijska sredstva**

- **Energenti**

- UNP - utekočinjen naftni plin (shranjen v plinohramih):
  - Hlev PL1 (**N1, N2**) – **SkR1 (Rez1 in Rez2)**, dva podzemna rezervoarja, vsak po 5 m<sup>3</sup>, vgrajena sta na zahodni strani novega hleva;
  - Hlev 5 (**N4**) – **SkR2 (Rez3)**; nadzemni rezervoar, volumen 5 m<sup>3</sup>, stoji na JV strani hleva 5;
  - Hlev Nova vzreja (**N3**) – **SkR3 (Rez4)**; nadzemni rezervoar, volumen 5 m<sup>3</sup>, stoji na SV strani hleva 5;
- Električna – se ne skladišči, na območja farme je transformatorska postaja;

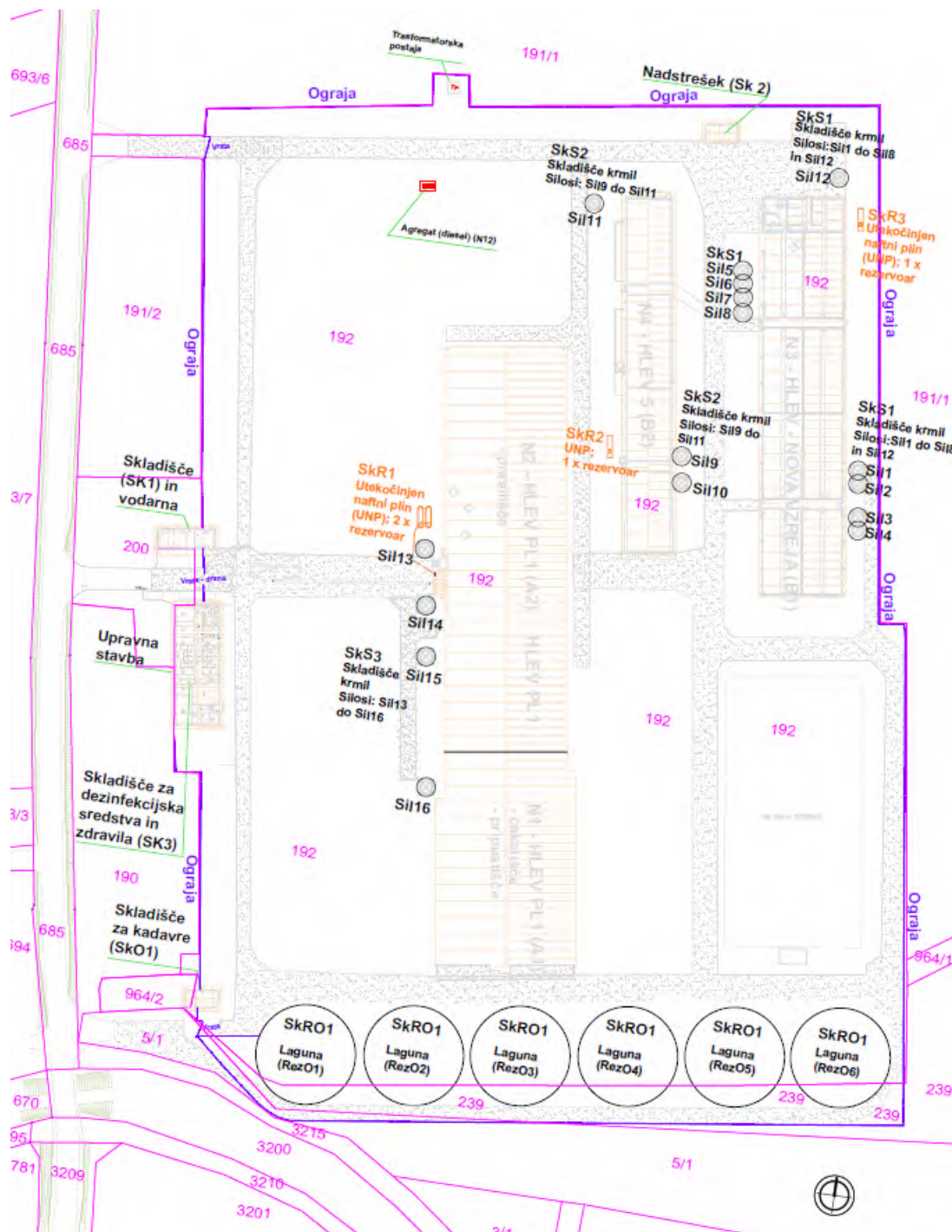
- **Odpadki**

- Pralne odpadne vode (se skladišči, vendar ni odpadek, gnojilo) - (**SkRO1**), ki so speljane po interni kanalizaciji do betonskih lagu na južni strani območja farme;
- Gnojevka – nastaja v 3 hlevih, ki se nahajajo na območju farme. Gnojevka se po interni kanalizaciji steka v 6 lagun (**RezO1-RezO6**), ki predstavljajo skladišče za gnojevko (**SkRO1**).
- Kadavri – predstavljajo poginule živali v tehnološkem procesu intenzivne reje živali. Kadavri se začasno skladiščijo v objektu, ki predstavlja skladišče za kadavre (**SkO1**) – v zgradbi Z od lagun;

Na spodnji sliki so prikazana sledeča skladišča, ki se nahajajo na območju Farme Cven:

- skladišča silosi **SkS1 – SkS3 (Sil1 – Sil16)** – za krmo živali
- skladišče **Sk1** – skladišče za krmo v big bag vrečah in vodarna
- skladišče **Sk2** – skladišče za pomožni material (slama, žagovina, polena, suhi gnoj)
- skladišče **Sk3** – skladišče za dezinfekcijska sredstva (upravna stavba, prostor 13, lesena omara)
- skladišče za UNP plin: **SkR1-SkR3 (Rez1-4)**
- skladišče za gnojevko **SkRO1-SkRO6 (RezO1-6)**
- skladišče za kadavre **SkO1** (manjši objekt na JZ delu območja farme)





**Slika 8:** Shematski prikaz skladišč IED naprave

### Krma

Ob vsakem od treh hlevov so silosi za različno krmo živali v določenem hlevu (**SkS1-SkS3**). Ob hlevu PL1 (N1 in N2) so štiri silosi (Sil13-Sil16). Ob hlevu 5 (N4) so trije silosi (Sil9-Sil11). Ob hlevu Nova vzreja (N3) so štiri silosi in še eden severno od hleva. Skupaj je na območju farme 16 silosov (Sil1-Sil16).

Krmna mešanica se na lokacijo naprave dostavlja iz specializiranih obratov dobavitelja Jata Emona za proizvodnjo krmilnih mešanic, ki so primerne za vzrejo prašičev (tekači, pitanci, plemenske svinje). Krma se dobavlja s tovornimi vozili sproti.

Za najmanjše pujske se krma (PU prestarter, drobljenec) dovaža v big bag vrečah 500 kg in 30 kg vrečah, ter se se začasno skladišči v objektu pri vhodu (**Sk1**). Običajno je v objektu ca. 10 big bag vreč, ki se jih tedensko dostavi iz Jata Emona obrata. Objek Sk1, se nahaja tik ob vhodu na farmo. Gre za delno zidan objekt, velikosti skladišča:  $8,60 \text{ m} \times 4,40 \text{ m} = 37,85 \text{ m}^2$ . Zraven skladišča je vodovodna postaja dim  $4,70 \text{ m} \times 4,40 \text{ m} = 20,68 \text{ m}^2$  (izdano vodno dovoljenje za črpanje za tehnološke vode).

Vsa ostala krma pa se skladišči v različne silose (**SkS1-SkS3**), ki se nahajajo ob vsakem hlevu. Vrsta krme je odvisna glede na vrsto (svinje, tekači, pitanci) in vzrejno fazo živali.

Poraba krmnih mešanic glede na vrsto in razvojno fazo živali, je kot sledi:

- Svinje:

- S Brej – za svinje za pripust in breje svinje, poraba 215.730 kg
- S Doj – za doječe svinje, poraba 189.504 kg

Skupaj so na letni ravni približno 3 cikli, kar pomeni skupaj letna poraba približno 1.216 ton.

- Tekachi (pujski do 30 kg):

- PU – prestarter, poraba 24.200 kg,
- PU-starter z ribjo moko, poraba 33.880 kg,
- PU-starter 1 dr.F, poraba 43.560 kg,
- PU-starter-2.F, poraba 33.880 kg,

Skupaj: 135.520 kg na en cikel. Na leto se jih obrne ca. 3, zato je to skupna letna poraba 406.560 kg oz. Približno 407 ton.

- Prašiči pitanci:

- PU-Grover, poraba 101.520 kg, to je za en cikel vzreje, ki traja 120 dni.

Torej je to na leto ca. 304.560 kg oz. približno 305 ton.

Skupna količina porabe krme v celem letu, za vse živali na farmi Cven, je ca. 1928 ton.

## **Odpadki**

V proizvodnem procesu glede na to, da večinski del reje živali poteka na rešetkastih tleh brez nastilja, nastaja **gnojevka (klasifikacijska številka 02 01 06)**, ki se zbira v bazenih pod hlevi. Ta se po kanalizaciji steka v betonske lagune, kjer se skladišči do odvoza na kmetijske površine.

Investitor razpolaga s 488 ha obdelovalnih površin, ki so primerna za raztros gnojevke. Celotna evidenca raztrosa se vodi v Gnojilnih načrtih. Količina gnojevke je ocenjena na  $7.612 \text{ m}^3/\text{leto}$ , za celotno farmo. Preračun je izdelan na podlagi Priloge 1, Preglednice 3, Uredbe o varstvu voda pred onesnaževanjem z nitrati iz kmetijskih virov (Uradni list RS, št. 113/09, 5/13, 22/15, 12/17 in 44/22 – ZVO-2).

Iz preračuna izhaja, da bi farma potrebovala v skladu z zakonodajo, prostor za ca.  $3.806 \text{ m}^3$  gnojevke za polletno obdobje. Glede na to, da farma deluje v zelo zmanjšani obliki glede na število živali in prvotno potrebo po skladiščenju gnojevke, so tako potrebe za skladiščenje več kot dovolj. Kapaciteta vseh lagun je namreč  $10.200 \text{ m}^3$ .

Za potrebe skladiščenja nastale gnojevke, ki bo nastajala po izvedbi posega, investitor razpolaga s šestimi (6) lagunami, s skupno prostornino 10.200 m<sup>3</sup> (to je max. Volumen, ki pa nikoli ni dosežen, saj se lagune polnijo do 2/3 volumna). Glede na izračun, glede letne količine nastale gnojevke, bi farma potrebovala ca. 3.800 m<sup>3</sup> veliko skladišče, za polletno skladiščenje, kar pomeni, da razpolaga z večjim skladiščem, kot je potrebno. Vsaka laguna je dimenzij notranjega premera 21 m, višine 4 m ter prostornine max. 1.700 m<sup>3</sup>.

#### **Pogin živali – skladiščenje kadavrov**

V procesu intenzivne reje živali, pride tudi do pogina živali. Kadavri se do odvoza, skladiščijo v posebnem objektu – hladilnici, ki je ločen od objektov hleva. Ocenjena količina nastalih odpadnih živalskih tkiv je 16 t letno. Poginule živali so odpadki z nazivom Odpadna živalska tkiva (pogin živali) in klasifikacijsko št. 02 01 02. Objekt za skladišče kadavrov SkO1, se nahaja na skrajni JZ meji območja farme, kjer je direkten dostop za tovorna vozila, ki odvažajo kadavre. Objekt je velikosti 8 m x 4 m = 32 m<sup>2</sup>. Skladišče je razdeljeno na dva dela, čisti del in del za odvoz. Vsakodnevni odvoz kadavrov opravlja Nacionalni veterinarski inštitut, enota Murska Sobota, Veterinarsko higienska služba.

#### **Pomožni material**

Med pomožni material štejemo tudi **dezinfekcijsko sredstvo**. Uporablja se **Virocid** in **Prophyl S**, ki se skladiščita v omari, v manjšem prostoru, velikosti 5 m<sup>2</sup> (prostor št. 13), v upravni stavbi. Za dezobariere se uporablja Virocid. Naredi se mešanica, kjer se zmeša 2% (20 ml/l vode) v vodo in se vlije v neprepustne prenosljive bariere. Ko stopimo na dezobariero se snov s pomočjo pene nanese na obutev. Poraba na letni ravni je 20 l. Uporabljajo se dezobariere pred vstopom v farmo in pred vsako sobo.

**Prophylis** se uporablja za dezinfekcijo hlevov. Meša se ga prav tako 1-2% raztopino, ki se potem nanaša na površine v hlevu.

Skladno z *Navodilom za pripravo Ocene možnosti onesnaženja tal in podzemne vode, MOP, julij 2022* v obseg IED dovoljenja lahko sodijo tudi druge naprave, ki niso IED naprave. Za namene priprave Ocene možnosti onesnaženja tal in podzemne vode (OMO) oziroma določitve nevarnih snovi in na podlagi tega zadevnih nevarnih snovi se upoštevajo samo IED naprave, v katerih se nevarne snovi skladiščijo, uporabljajo, proizvajajo ali se jih izpušča na območju IED naprave zaradi opravljanja IED dejavnosti. Glede na to, da je druga nepovezana dejavnost (vzreja prašičev pitancev) v obravnavanem primeru ločena od obravnavane IED naprave, nevarne snovi, ki se jih uporablja v sklopu vzreje prašičev pitancev niso zajete.



## 4 DOLOČITEV SEZNAMA NEVARNIH SNOVI

### 4.1 NEVARNE SNOVI

#### 4.1.1 Dezinfekcijsko sredstvo

Za dezinfekcijo se uporablja vodne raztopine dezinfekcijskega sredstva. Uporablja se dezinfekcijsko sredstvo PROPHYL® S ali/in Virocid™. Dezinfekcijska sredstva se skladišči v posebnem prostoru v upravni stavbi. Na zalogi je največ 3 x 5 l (skupaj 15 l) dezinfekcijskega sredstva. Na letni ravni se porabi do 550 l PROPHYL® S in/ali 550 l Virocid™.

##### 4.1.1.1 PROPHYL® S

PROPHYL® S, je dezinfekcijsko sredstvo proizvajalca HUVEPHARMA SA, 34, rue Jean Monnet, Z.I. Etriche, Serge, 49500 Serge-en-Anjou Bleu, Francija. Gre za vodno raztopino štirih (4) dezinfekcijsko aktivnih sestavin in površinsko aktivnih snovi. Dezinfekcijsko aktivne sestavine so:

- klorokrezol,
- natrijev C14-17 alkil sec-sulfonat,
- glikolna kislina.

Skupna vsebnost aktivnih snovi je od 25 % do 55 % (utežni odstotki).

Dezinfekcijsko sredstvo PROPHYL® S je nevarna snov (zmes). Podrobnejši podatki o nevarnih snoveh so podani poglavju 4.1.5 Seznam nevarnih snovi.

Vodna raztopina dezinfekcijskega sredstva PROPHYL® S se uporablja pri 1 - 2 % koncentraciji.

Sredstvo za razkuževanje hlevov se uporablja samo v notranjosti hlevov na območju IED naprave. Z razprševanjem vodne raztopine nevarnih snovi se te oprimejo notranjih površin v hlevih (površine tal, sten in opreme v hlevih), ker voda ob dotiku s površinami v obdelavi izhlapi. Aktivne komponente dezinfekcijskega sredstva so nevarne snovi, ki na površinah v obdelavi delujejo biocidno in **se v nekaj dneh biološko oziroma kemijsko razgradijo**.

Ne glede na stavke o nevarnosti iz tabele 1 poglavja »4.1.5 Seznam nevarnih snovi« se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrti (4.) odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).

Vse komponente dezinfekcijskega sredstva PROPHYL® S so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 2 k temu dokumentu). Skladno z navedenim **dezinfekcijsko sredstvo PROPHYL® S ni zadevna nevarna snov**.

##### 4.1.1.2 Virocid™

Virocid™, je dezinfekcijsko sredstvo proizvajalca CID LINES NV, Waterpoortstraat, 2, B-8900 Ieper - Belgique. Gre za vodno raztopino štirih (4) dezinfekcijsko aktivnih sestavin in površinsko aktivnih snovi. Dezinfekcijsko aktivne sestavine so:

- alkildimetil benzalkonijev klorid,
- didecildimetilamonijevklorid,

- glutaraldehid in
- izopropanol.

Skupna vsebnost aktivnih snovi je od 30 % do 75 % (utežni odstotki).

Dezinfekcijsko sredstvo Virocid™ je tudi nevarna snov (zmes). Podrobnejši podatki nevarnih snoveh so podani poglavju 4.1.5 Seznam nevarnih snovi.

Vodna raztopina dezinfekcijskega sredstva Virocid™ se uporablja pri 1 - 2 % koncentraciji.

Sredstvo za razkuževanje hlevov se uporablja samo v notranjosti hlevov na območju IED naprave. Z razprševanjem vodne raztopine nevarnih snovi se te oprimejo notranjih površin v hlevih (površine tal, sten in opreme v hlevih), ker voda ob dotiku s površinami v obdelavi izhlapi. Aktivne komponente dezinfekcijskega sredstva so nevarne snovi, ki na površinah v obdelavi delujejo biocidno in **se v nekaj dneh biološko oziroma kemijsko razgradijo**.

Ne glede na stavke o nevarnosti iz tabele 1 poglavja »4.1.5 Seznam nevarnih snovi« se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrti (4.) odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).

Vse komponente dezinfekcijskega sredstva Virocid™ so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 3 k temu dokumentu). Skladno z navedenim **dezinfekcijsko sredstvo Virocid™ ni zadevna nevarna snov**.

#### **4.1.2 Utekočinjeni naftni plin (UNP) za ogrevanje**

Za ogrevanje hlevov se kot energent uporablja utekočinjen naftni plin (UNP). V vsakem od hlevov je kotel na utekočinjen naftni plin. Ob vsakem hlevu je tudi ločeno plinohram za UNP. Predvidena poraba utekočinjenega naftnega plina (UNP) na letni ravni je 90.000 l oz. 90 m<sup>3</sup> UNP/leto (50 t UNP/leto pri normalnih pogojih).

Utekočinjen naftni plin (UNP) se hrani (skladišči) v plinohramih:

- Hlev PL1 (N1, N2) – SkR1 (Rez1 in Rez2), dva podzemna rezervoarja, vsak po 5 m<sup>3</sup>, vgrajena sta na zahodni strani novega hleva;
- Hlev 5 (N4) – SkR2 (Rez3); nadzemni rezervoar, volumen 5 m<sup>3</sup>, stoji na JV strani hleva 5;
- Hlev Nova vzreja (N3) – SkR3 (Rez4); nadzemni rezervoar, volumen 5 m<sup>3</sup>, stoji na SV strani hleva 5.

Utekočinjeni naftni plin je mešanica plinov propana in butana:

- Kemijsko ime: ogljikovodiki, C3-4
- Št. CAS: 68476-40-4
- Št. EC: 270-681-9
- Št. INDEKS: 649-199-00-1
- REACH registracijska št.: 01-2119486557-22-0009.

Skladno z zadnjim odstavkom priloge 3 (pragovi letne prisotnosti zadevnih nevarnih snovi) Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) se med zadevne

nevarne snovi ne uvrščajo nevarne snovi, ki se uporabljajo za ogrevanje stavb. **Glede na navedeno se utekočinjeni naftni plin (UNP) ne uvršča med zadevne nevarne snovi.**

#### 4.1.3 Gorivo za agregat

Ob izpadu električne energije v javnem omrežnem sistemu, se kot rezervno električno napajanje hlevov uporablja diesel elektro agregat na dizelsko gorivo N12 z izpustom Z8. Ta se zažene avtomatsko ob izpadu zunanega električnega napajanja. Diesel agregat je moči 100 kW električne moči. Gorivo se nahaja v agregatu, drugega goriva se ne skladišči. Agregat je nameščen severno od novega hleva PL1.

V primeru izpada električne napetosti iz elektroenergetskega omrežja se le to zagotavlja preko dizelskega agregata (N12). V agregatu je tudi 250 l rezervoar dizla. En hlev na letni ravni porabi ca. 50 l dizelskega goriva. Skupaj trije hlevi porabijo ca. 150 l dizelskega goriva letno. Trenutno se na farmi oz. v sklopu IED naprave ne skladišči dizelskega goriva izven rezervoarja agregata. Za potrebe IED naprave (dizelski agregat – N12) se letno sproti gorivo dobavi enkrat (1x) 150 litrov/leto. Glede na navedeno, je v rezervoar po letni dobavi poln. Takrat vsebuje 250 l dizla oz. 216,7 kg dizla. Dizelsko gorivo sodi med nevarne tekočine.

##### 4.1.3.1 Dizelsko gorivo

Dizelsko gorivo je kompleksna kombinacija ogljikovodikov, je eden od derivatov frakcionirane destilacije nafte. Dizelsko gorivo je tekočina. Vsebuje predvsem ogljikovodike od C<sub>9</sub> do C<sub>20</sub>, z vreliščem od 163 °C do 357 °C.

Skladno z zadnjim odstavkom priloge 3 (pragovi letne prisotnosti zadevnih nevarnih snovi) Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) se med zadevne nevarne snovi ne uvrščajo nevarne snovi v nepremičnih motorjih z notranjim izgorevanjem za zasilno napajanje v trajanju manj kot 300 ur na leto ali v rezervoarjih za gorivo v tovornih vozilih in delovnih strojih, ki se uporabljajo za njihovo delovanje ali za namene delovanja njihove opreme, če so za tovarna vozila in delovne stroje zagotovljeni redni predpisani tehnični pregledi, s katerimi se izkazuje njihova tehnična brezhibnost. Ne glede na stavke o nevarnosti iz zgornje tabele se tekoča goriva, ki niso zajeta v prejšnji stavek, uvrščajo v skupino 4 navedene priloge.

Skladno z navedenim **se dizelsko gorivo** agregata in delovnih strojev ter tovornih vozil, ograbnavane naprave, **ne obravnava kot zadevne nevarne snovi.**

#### 4.1.4 Deratizacijsko sredstvo

Za deratizacijo se uporablja mehka DESANT modra vaba. Vaba se nastavlja na treh (3) mestih ob vsakem od hlevov, torej na devetih mestih IED naprave. DESANT modra vaba se dobavlja v pločevinkah neto vsebnosti vab 150 g. Proizvajalec je BIOTEH podjetje za biotehnologijo d.o.o., Preserska c. 9, 1235 Radomlje. Na letni ravni se porabi ca. za 3 kg mehke DESANT modre vabe. Glede na to, da je vsebnost aktivne snovi brodifakum 0,005 %, je poraba na letni rabi 0,15 g aktivne snovi.

Deratizacijska sredstva se uporablja v sklopu vzdrževanja stavb oz. tehnoloških enot. Med zadevne nevarne snovi se ne uvrščajo nevarne snovi, ki se uporabljajo za vzdrževanje stavb in tehnoloških enot (zadnji odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).

Skladno z navedenim se **deratizacijsko sredstvo DESANT modra vaba** **ne obravnava kot zadevna nevarna snov.**

4.1.5 Seznam nevarnih snovi

Tabela 1: Tabela nevarnih snovi

1.korak: seznam nevarnih snovi					2.korak: določitev seznama zadevnih nevarnih snovi							3.korak: možnost onesnaženja tal in podzemne vode na območju IED naprave		
Trgovsko ime snovi ali zmesi	Kemijsko ime snovi	CAS št. snovi	Vsebnost snovi [%]	H stavki snovi ali zmesi	Agregatno stanje pri 20 °C [G, L, S] <sup>(1)</sup>	Topnost, hidrofobnost, hlapnost mobilnost	Obstojnost (P) Bioakumulativnost (B) Strupenost za vodne organizme (T)  Kancerogenost (C) Mutagenost (M) Strupenost za reprodukcijo (R)  ( <sup>2</sup> )	Skupina po Prilogi 3 Uredbe IED	Letna prisotnost snovi ali zmesi (kg/leto)	Zadevna nevarna snov (DA/NE)	Skupina presega prag iz priloge 3 Uredbe IED (DA/NE) <sup>(3)</sup>	Predmet IP (DA/NE) <sup>(4)</sup>	Obrazložitev	Oznaka zadevne nevarne snovi
1.	2.	3.	4.	5.	6. <sup>(1)</sup>	7.	8. <sup>(2)</sup>	9.	10.	11.	12. <sup>(3)</sup>	13. <sup>(4)</sup>	14.	15.
Virocid™	Nima. Gre za zmes: - alkildimetil benzalkonijev klorid, - didecildimetilamonijevklorid, - glutaraldehid, - izopropanol.	Zmes nima CAS št.  68424-85-1 7173-51-5 111-30-8 67-63-0	25-55	H226, H302, H332, H314, H334, H317, H400, H411	L	vodotopna	Tako zmes kot posamezne komponente hitro biorazgradljive (vir: ECHA, glej prilogo 3 k temu dokumentu)	2	412,5	NE	NE	NE	Ne glede na stavke o nevarnosti iz te tabele 1 se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrta (4.) odstavka priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).  Vse komponente dezinfekcijskega sredstva Virocid™ so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 3 k temu dokumentu). Skladno z navedenim dezinfekcijsko sredstvo Virocid™ ni zadevna nevarna snov.	Ni relevantno.
PROPHYL® S	Nima. Gre za zmes: - klorokrezol, - natrijev C14-17 alkil sec-sulfonat, - glikolna kislina.	Zmes nima CAS št. 59-50-7 97489-15-1 79-14-1	25-55	H314, H317, H412	L	vodotopna	Tako zmes kot posamezne komponente hitro biorazgradljive (vir: ECHA, glej prilogo 3 k temu dokumentu)	3	302,5	NE	NE	NE	Ne glede na stavke o nevarnosti iz te tabele 1 se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrta (4.) odstavka priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).  Vse komponente dezinfekcijskega sredstva PROPHYL® S so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 2 k temu dokumentu). Skladno z navedenim dezinfekcijsko sredstvo PROPHYL® S ni zadevna nevarna snov.	Ni relevantno.

1.korak: seznam nevarnih snovi					2.korak: določitev seznama zadevnih nevarnih snovi							3.korak: možnost onesnaženja tal in podzemne vode na območju IED naprave		
Trgovsko ime snovi ali zmesi	Kemijsko ime snovi	CAS št. snovi	Vsebnost snovi [%]	H stavki snovi ali zmesi	Agregatno stanje pri 20 °C [G, L, S] <sup>(1)</sup>	Topnost, hidrofobnost, hlapnost mobilnost	Obstojnost (P) Bioakumulativnost (B) Strupenost za vodne organizme (T)  Kancerogenost (C) Mutagenost (M) Strupenost za reprodukcijo (R)  ( <sup>2</sup> )	Skupina po Prilogi 3 Uredbe IED	Letna prisotnost snovi ali zmesi (kg/leto)	Zadevna nevarna snov (DA/NE)	Skupina presega prag iz priloge 3 Uredbe IED (DA/NE) <sup>(3)</sup>	Predmet IP (DA/NE) <sup>(4)</sup>	Obrazložitev	Oznaka zadevne nevarne snovi
1.	2.	3.	4.	5.	6. <sup>(1)</sup>	7.	8. <sup>(2)</sup>	9.	10.	11.	12. <sup>(3)</sup>	13. <sup>(4)</sup>	14.	15.
DESANT modra vaba	Nima. Gre za zmes. Aktivna snov je Brodifakum	56073-10-0	0,005	H360D, H373	S	hidrofobnost	T	2	3	NE	NE	NE	Deratizacijska sredstva se uporablja v sklopu vzdrževanja stavb oz. tehnoloških enot. Med zadevne nevarne snovi se ne uvrščajo nevarne snovi, ki se uporabljajo za vzdrževanje stavb in tehnoloških enot (zadnji odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)). Skladno z navedenim se deratizacijsko sredstvo DESANT modra vaba ne obravnava kot zadevna nevarna snov.	Ni relevantno.
Dizelsko gorivo	Dizelsko gorivo (ogljikovodiki z verigo ogljikovih atomov C <sub>9</sub> do C <sub>20</sub> )	269-822-7	93	H226, H304, H315, H351, H373, H411	L	hidrofobnost	/	2	216,7*	NE	NE	NE	Skladno z zadnjim odstavkom priloge 3 Uredbe IED se med zadevne nevarne snovi ne uvrščajo nevarne snovi v nepremičnih motorjih z notranjim izgorevanjem za zasilno napajanje v trajanju manj kot 300 ur na leto ali v rezervoarjih za gorivo v tovornih vozilih in delovnih strojih, ki se uporabljajo za njihovo delovanje ali za namene delovanja njihove opreme, če so za tovorna vozila in delovne stroje zagotovljeni redni predpisani tehnični pregledi, s katerimi se izkazuje njihova tehnična brezhibnost. Ne glede na stavke o nevarnosti iz zgornje tabele se tekoča goriva, ki niso zajeta v prejšnji stavek, uvrščajo v skupino 4 navedene priloge.	Ni relevantno.
Utekočinjen naftni plin (UNP)	Nima. Gre za zmes plinov: - propana - butan - buta-1,3-dien	Zmes nima CAS št. 106-97-8 74-98-6 106-99-0	65 35 <0,1	H220, H280	L (utekočinjen plin - G)	Zelo hlapno	/	/	50.000	NE	NE	NE	Skladno z zadnjim odstavkom priloge 3 (pragovi letne prisotnosti zadevnih nevarnih snovi) Uredbe IED se med zadevne nevarne snovi ne uvrščajo nevarne snovi, ki se uporabljajo za ogrevanje stavb. Glede na navedeno se utekočinjeni naftni plin (UNP) ne uvršča med zadevne nevarne snovi.	Ni relevantno.

(1) Pomen kratic: G – plin (Gas)  
L – tekoče (Liquid)  
S – trdno (Solid)

(2) Preverite ali je snov ali zmes na seznamu SVHC snovi in v kolikor da, to vpišite v stolpec 8.

(3) Opomba: Če IED naprava leži na vodovarstvenem območju, ugotavljanje, ali skupina presega prag letne prisotnosti ni potrebno – stolpca ni treba izpolniti.

(4) Opomba: Če IED naprava leži na vodovarstvenem območju, so opredeljene zadevne nevarne snovi (stolpec 11) predmet IP ne glede na pragove iz priloge 3 Uredbe IED. V kolikor nevarna snov ni opredeljena kot zadevna nevarna snov, ni predmet nadaljnega postopka IP.

## 4.2 ZADEVNE NEVARNE SNOVI

### 4.2.1 PROPHYL® S - Dezinfekcijsko sredstvo

#### 4.2.1.1 Splošni opis in določitev zadevne nevarne snovi (DA/NE)

Sestava, lastnosti in uporaba dezinfekcijskega sredstva so podana v poglavju 4.1.1.1 PROPHYL® S.

Aktivne komponente dezinfekcijskega sredstva so nevarne snovi, ki na površinah v obdelavi delujejo biocidno in se v nekaj dneh biološko oziroma kemijsko razgradijo. Zmes je glede na H stavke (tabela 1 prejšnjega poglavja) potencialno zadevno nevarna snov. Ne glede na stavke o nevarnosti iz tabele 1 poglavja »4.1.5 Seznam nevarnih snovi« se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrti (4.) odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).

Vse komponente dezinfekcijskega sredstva PROPHYL® S so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 2 k temu dokumentu).

**Skladno z navedenim dezinfekcijsko sredstvo PROPHYL® S ni zadevna nevarna snov.**

#### 4.2.1.2 Transportne poti in ravnanje z PROPHYL® S (4. alineja, 11. člen Uredbe)

Sredstva za razkuževanje (PROPHYL® S), se dostavi na območje farme z osebnim vozilom. Dostavi se v originalni embalaži po 5 l. Transportna pot za PROPHYL® S, je prikazana na grafični prilogi G.2 k dokumentaciji. Vse transportne poti na farmi in do farme so asfaltirane.

Dostavljena sredstva za razkuževanje notranjosti in opreme hlevov se v originalni proizvajalčevi embalaži odložijo v skladišču za dezinfekcijska sredstva v upravni stavbi.

Vodna raztopina sredstev za razkuževanje notranjosti in opreme hlevov za dezinfekcijo pripravijo v vsakem posameznem hlevu, in sicer v količini, ki je potrebna za njegovo razkužitev.

Pri pripravi raztopine za dezinfekcijo se vedno tudi spere preostala embalaža, ki zato ni nevaren odpadek.

Vse transportne poti v sklopu farme so izven hlevov. Tla v notranjosti hlevov so vodotesno utrjena z zaglajenim betonom.

#### 4.2.1.3 Okoliščine ali dogodki, ki lahko povzročijo izpust PROPHYL® S: (7. alineja, 11. člen Uredbe)

Okoliščina ali dogodek, ki lahko povzročita nenadzorovan izpust nevarnih snovi, je nesreča, katere posledica je razlitje sredstev za razkuževanje na območju IED naprave na transportni poti do hleva. Če pride do razlitja sredstev za razkuževanje v notranjosti posameznega hleva, na primer pri pripravi vodne raztopine za razkuževanje z razprševanjem, je to okoliščina ali dogodek, ki ne moreta povzročiti nenadzorovanega izpusta zadevnih nevarnih snovi v okolje, ker so tla v hlevih za vodo neprepustna in se razlita sredstva lahko zajame brez nevarnosti izpusta v okolje.

Pri uporabi sredstev za razkuževanje ni izpustov nevarnih snovi v okolje. Z razprševanjem vodne raztopine nevarnih snovi se te oprimejo notranjih površin v hlevih (površine tal, sten in opreme v hlevih), ker voda ob dotiku s površinami v obdelavi izhlapi. Nevarne snovi na površinah v obdelavi delujejo biocidno in se v nekaj dneh biološko oziroma kemijsko razgradijo.

## **4.2.2 Virocid™ - Dezinfekcijsko sredstvo**

### **4.2.2.1 Splošni opis določitev zadevne nevarne snovi (DA/NE)**

Sestava, lastnosti in uporaba dezinfekcijskega sredstva so podana v poglavju 4.1.1.2 Virocid™.

Aktivne komponente dezinfekcijskega sredstva so nevarne snovi, ki na površinah v obdelavi delujejo biocidno in se v nekaj dneh biološko oziroma kemijsko razgradijo. Zmes je glede na H stavke (tabela 1 prejšnjega poglavja) potencialno zadevno nevarna snov. Ne glede na stavke o nevarnosti iz tabele 1 poglavja »4.1.5 Seznam nevarnih snovi« se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrti (4.) odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).

Vse komponente dezinfekcijskega sredstva Virocid™ so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 3 k temu dokumentu).

**Skladno z navedenim dezinfekcijsko sredstvo Virocid™ ni zadevna nevarna snov.**

### **4.2.2.2 Transportne poti in ravnanje z virocidom (4. alineja, 11. člen Uredbe)**

Sredstva za razkuževanje (virocid), ki vsebujejo nevarne snovi, se dostavi na območje farme z osebnim vozilom. Dostavi se virocid™ v originalni embalaži po 5 l. Transportna pot za virocid, je prikazana na grafični prilogi G.2 k dokumentaciji. Vse transportne poti na farmi in do farme so asfaltirane.

Dostavljena sredstva za razkuževanje notranjosti in opreme hlevov se v originalni proizvajalčevi embalaži odložijo v skladišču za dezinfekcijska sredstva v upravni stavbi.

Vodna raztopina sredstev za razkuževanje notranjosti in opreme hlevov za dezinfekcijo pripravijo v vsakem posameznem hlevu, in sicer v količini, ki je potrebna za njegovo razkužitev.

Pri pripravi raztopine za dezinfekcijo se vedno tudi spere preostala embalaža, ki zato ni nevaren odpadek.

Vse transportne poti v sklopu farme so izven hlevov. Tla v notranjosti hlevov so vodotesno utrjena z zaglajenim betonom.

### **4.2.2.3 Okoliščine ali dogodki, ki lahko povzročijo izpust virocida: (7. alineja, 11. člen Uredbe)**

Okoliščina ali dogodek, ki lahko povzročita nenadzorovan izpust nevarnih snovi, je nesreča, katere posledica je razlitje sredstev za razkuževanje na območju IED naprave na transportni poti do hleva. Če pride do razlitja sredstev za razkuževanje v notranjosti posameznega hleva, na primer pri pripravi

vodne raztopine za razkuževanje z razprševanjem, je to okoliščina ali dogodek, ki ne moreta povzročiti nenadzorovanega izpusta zadevnih nevarnih snovi v okolje, ker so tla v hlevih za vodo neprepustna in se razlita sredstva lahko zajame brez nevarnosti izpusta v okolje.

Pri uporabi sredstev za razkuževanje ni izpustov nevarnih snovi v okolje. Z razprševanjem vodne raztopine nevarnih snovi se te oprimejo notranjih površin v hlevih (površine tal, sten in opreme v hlevih), ker voda ob dotiku s površinami v obdelavi izhlapi. Nevarne snovi na površinah v obdelavi delujejo biocidno in se v nekaj dneh biološko oziroma kemijsko razgradijo.

#### **4.2.3 DESANT modra vaba - Deratizacijsko sredstvo**

##### **4.2.3.1 Splošni opis**

Sestava, lastnosti in uporaba so podana v poglavju 4.1.4 Deratizacijsko sredstvo.

Deratizacijska sredstva se uporablja v sklopu vzdrževanja stavb oz. tehnoloških enot. Med zadevne nevarne snovi se ne uvrščajo nevarne snovi, ki se uporabljajo za vzdrževanje stavb in tehnoloških enot (zadnji odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).

Skladno z navedenim se deratizacijsko sredstvo **DESANT modra vaba ne obravnava kot zadevna nevarna snov.**

##### **4.2.3.2 Transportne poti in ravnanje z DESANT modro vabo (4. alineja, 11. člen Uredbe)**

Sredstva za deratizacijo (DESANT modra vaba), ki vsebujejo nevarne snovi, se dostavi na območje farme z osebnim vozilom veterinarske ambulante. Dostavi se DESANT modra vaba v originalni embalaži. Sredstvo za deratizacijo se dostavlja sproti po potrebah in se ga na območju farme ne skladišči. Transportna pot za DESANT modro vabo, je prikazana na grafični prilogi G.2.. Transportna cesta je izven hlevov.

Količine vab so v času transporta zelo majhne in so v originalni kovinski embalaži.

Vse transportne poti v sklopu farme so izven hlevov. Transportne poti in dvorišče so asfaltirani. Tla v notranjosti hlevov so vodotesno utrjena z zaglajenim betonom.

##### **4.2.3.3 Okoliščine ali dogodki, ki lahko povzročijo izpust DESANT modre vabe: (7. alineja, 11. člen Uredbe)**

Gre za zmes DESANT modra vaba, ki je v trdni obliki. Namenjena je deratizaciji. Uporablja se v majhnih količinah. Glede na to, da je vsebnost aktivne snovi brodifakum 0,005 %, je poraba na letni rabi 0,15 g aktivne snovi.

Glede na to, da vabe nastavlja in odstranjuje pooblaščen organizacija, da je količina zelo majhna je tudi verjetnost, da bi prišlo do neustrezne uporabe tako v smislu zdravja ljudi kot tudi okoljske nesreče zelo majhna oz. nepomembna.

#### **4.2.4 Izpolnjevanje ukrepov za preprečevanje onesnaževanje (8. alineja 11. člena**



## **Uredbe)**

Na območju farme je zaradi preprečevanja onesnaževanja tal in podzemne vode z nevarnimi snovmi zagotovljeno:

- brezhibno in zanesljivo obratovanje opreme hlevov in silosov, tako da je pri obratovanju in vzdrževanju naprave preprečeno onesnaževanja tal in podzemne vode,
- vodenje vzdrževalnega dnevnika o izvajanju tehničnih ukrepov brezhibnega in zanesljivega obratovanja opreme in instalacij,
- izvajanje drugih rednih pregledov tehničnih ukrepov za preprečevanje onesnaževanja tal in podzemne vode,
- razkuževanje notranjih prostorov in opreme hlevov s strani usposobljenih in za dezinfekcijo pooblaščenih zunanjih izvajalcev, ki zagotavljajo tudi varen transport sredstev, ki vsebujejo nevarne snovi.

### **4.2.5 Sklepne ugotovitve o obveznosti predložitve izhodiščnega poročila (9. alineja 11. člena Uredbe)**

Na lokaciji farme se izvaja naslednje ukrepe za preprečevanje onesnaženja okolja:

- Naprave, v katerih se uporablja dizelsko gorivo in tudi druge nevarne kemikalije so tehnično brezhibne, kar se zagotavlja z občasnimi pregledi in rednim vzdrževanjem.
- Rezervoar in lovilnik razlitih tekočin sta v sklopu agregata. Lovilnik razlitih tekočin prepreči morebitno razlitje nevarne tekočine.
- Vse nevarne kemikalije se hrani v prostorih z vodotesno utrjenimi tlemi. Kemikalije so vedno v originalni embalaži, majhnih količin. Tudi če gre za začasno – dnevno hrambo.
- Na lokaciji je vedno na razpolago univerzalni absorbent za primer morebitnih razlitij nevarnih tekočin.
- Na lokaciji so na razpolago varnostni listi za nevarne kemikalije.

Prepričani smo, da je tveganje za onesnaženje tal in podtalnic z nevarnimi kemikalijami majhno in da ga z navedenimi ukrepi dobro obvladujemo.

**Na območju naprave ni zadevnih nevarnih snovi iz Priloge 3 Uredbe IED. Na podlagi navedenega in dejstva, da območje IED naprave ni na vodovarstvenem območju, ocenjujemo, da za Farmo Cven, ni treba izdelati izhodiščnega poročila.**

**Skladno z navedenim ni treba priložiti poročila o pregledu tehničnih ukrepov za preprečevanje onesnaženja tal in podzemne vode.**

## **5 PREGLED SKLADNOSTI Z DOLOČBAMI UREDBE O IED NAPRAVAH**

V 7. členu Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), so določeni tehnični ukrepi za preprečevanje onesnaževanja tal in podzemne vode. Upravljavalec obravnavane IED naprave na območju skladišči nevarne snovi v ustrezno urejenem skladiščnem prostoru z vodotesno utrjenimi tlemi (beton). Dezinfekcijski sredstvi PROPHYL® S in Viroid™ se skladišči v originalni plastični embalaži, največ 3 x 5 l. Na mestu skladiščenja je ves čas na voljo adsorbentsko sredstvo za primer razlitje. Vodno raztopino (1-2 %) dezinfekcijskega sredstva se pripravi na lokaciji uporabe, to je v hlevu. Tla hlevov so betonska in so vodo nepropustna, zato zagotavljajo ustrezno varnost pred onesnaževanjem tal in podzemne vode. Pregled tehničnih ukrepov izvede skrbnik varstva okolja. S pregledom tehničnih ukrepov se zberejo zlasti informacije:

- morebitnih razpokah ali poškodbah na objektih in talnih površinah v bližini mest, na katerih bi bile mogoče emisije ali razlitje nevarnih snovi,
- znakov kemičnih poškodb na talnih površinah hlevov in skladišča dezinfekcijskih sredstev.

Skrbnik varstva okolja o pregledu tehničnih ukrepov izdela poročilo, ki obsega podatke in ugotovitve o izvajanju in stanju ukrepov za preprečevanje onesnaževanja tal in podzemne vode ter njihovi brezhibnosti.

V 8. členu Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), je določena izdelava ocene možnosti za onesnaženje tal in podzemne vode ter izhodiščnega poročila. Iz te »ocene možnosti za onesnaženje tal in podzemne vode« izhaja, da izdelava »izhodiščnega poročila«, ni potrebna. Iz vrste nevarnih snovi (glej tabelo 1 tega poročila) izhaja, da zadostuje izdelava »ocene možnosti za onesnaženje tal in podzemne vode« izhaja in da izdelava »izhodiščnega poročila« ni potrebna. Prav tako obravnavana lokacija ni na vodovarstvenem območju (glej poglavje »3.3.3 Vodovarstvena območja« tega poročila). Podani odgovori se nanašajo tudi na 12. člen Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22).

V 9. členu Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), je določena vsebina »ocena možnosti za onesnaženje tal in podzemne vode«. Določeno je, da vsebina »ocena možnosti za onesnaženje tal in podzemne vode«, vsebuje:

- seznam nevarnih snovi,
- ugotovitve in opis možnosti onesnaženja tal in podzemne vode z zadevnimi nevarnimi snovmi.

Seznam nevarnih snovi, seznam zadevnih nevarnih snovi, količina porabe teh snovi kot tudi količina letne prisotnosti zadevnih nevarnih snovi na obravnavanem območju so podani v poglavju »4 DOLOČITEV SEZNAMA NEVARNIH SNOVI«. Seznam nevarnih snovi je izdelan na podlagi pregleda vseh surovin in drugih snovi, ki se uporabljajo na Farmi Cven. Prav tako so podane tudi ugotovitve v zvezi z ravnanjem (skladiščenje, transport, ipd.) s temi snovmi, kot to določa 11. člen Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22).

Zahteve 11. člena Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), so obdelani v poglavju 4.2 tega dokumenta.

V 12. členu Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), so določeni pogoji za izdelavo izhodiščnega poročila. Opis v zvezi s temi ugotovitvami

smo podali v drugem odstavku tega poglavja, saj se navezuje na 8. člen Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22).

V 13. členu Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), je določena vsebina izhodiščnega poročila. Iz te »ocene možnosti za onesnaženje tal in podzemne vode« izhaja, da izdelava »izhodiščnega poročila«, ni potrebna. Zakaj izhodiščno poročilo ni potrebno izdelati, je opisano v drugem odstavku tega poglavja.

**Skladno s 14. členom Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Uradni list RS, št. 68/22), upravljavec mora hraniti »oceno možnosti za onesnaženje tal in podzemne vode« ves čas obratovanja IED naprave.**

## **PRILOGE**

### **Priloga 1:**

Tabela 1: SEZNAM NEVARNIH SNOVI – DOLOČITEV  
SEZNAMA ZADEVNIH NEVARNIH SNOVI

### **Priloga 2:**

Dokazila o biorazgradljivosti sestavnih komponent  
**dezinfekcijskega sredstva PROPHYL® S**

### **Priloga 3:**

Dokazila o biorazgradljivosti sestavnih komponent  
**dezinfekcijskega sredstva Virocid™**

## **Priloga 1:**

Tabela 1: SEZNAM NEVARNIH SNOVI – DOLOČITEV  
SEZNAMA ZADEVNIH NEVARNIH SNOVI

PRILOGA 1: Seznam nevarnih snovi

Tabela 1: Tabela nevarnih snovi

1.korak: seznam nevarnih snovi					2.korak: določitev seznama zadevnih nevarnih snovi							3.korak: možnost onesnaženja tal in podzemne vode na območju IED naprave		
Trgovsko ime snovi ali zmesi	Kemijsko ime snovi	CAS št. snovi	Vsebnost snovi [%]	H stavki snovi ali zmesi	Agregatno stanje pri 20 °C [G, L, S] <sup>(1)</sup>	Topnost, hidrofobnost, hlapnost mobilnost	Obstojnost (P) Bioakumulativnost (B) Strupenost za vodne organizme (T)  Kancerogenost (C) Mutagenost (M) Strupenost za reprodukcijo (R)  ( <sup>2</sup> )	Skupina po Prilogi 3 Uredbe IED	Letna prisotnost snovi ali zmesi (kg/leto)	Zadevna nevarna snov (DANE)	Skupina presega prag iz priloge 3 Uredbe IED (DANE) <sup>(3)</sup>	Predmet IP (DANE) <sup>(4)</sup>	Obrazložitev	Oznaka zadevne nevarne snovi
1.	2.	3.	4.	5.	6. <sup>(1)</sup>	7.	8. <sup>(2)</sup>	9.	10.	11.	12. <sup>(3)</sup>	13. <sup>(4)</sup>	14.	15.
Virocid™	Nima. Gre za zmes: - alkildimetil benzalkonijev klorid, - didecildimetilamonijevklorid, - glutaraldehid, - izopropanol.	Zmes nima CAS št.  68424-85-1 7173-51-5 111-30-8 67-63-0	25-55	H226, H302, H332, H314, H334, H317, H400, H411	L	vodotopna	Tako zmes kot posamezne komponente hitro biorazgradljive (vir: ECHA, glej prilogo 3 k temu dokumentu)	2	412,5	NE	NE	NE	Ne glede na stavke o nevarnosti iz te tabele 1 se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrty (4.) odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).  Vse komponente dezinfekcijskega sredstva Virocid™ so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 3 k temu dokumentu). Skladno z navedenim dezinfekcijsko sredstvo Virocid™ ni zadevna nevarna snov.	Ni relevantno.
PROPHYL® S	Nima. Gre za zmes: - klorokrezol, - natrijev C14-17 alkil sec-sulfonat, - glikolna kislina.	Zmes nima CAS št. 59-50-7 97489-15-1 79-14-1	25-55	H314, H317, H412	L	vodotopna	Tako zmes kot posamezne komponente hitro biorazgradljive (vir: ECHA, glej prilogo 3 k temu dokumentu)	3	302,5	NE	NE	NE	Ne glede na stavke o nevarnosti iz te tabele 1 se nevarne snovi ne uvrščajo med zadevne nevarne snovi, če so hitro biorazgradljive ali razgradljive v okolju (četrty (4.) odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)).  Vse komponente dezinfekcijskega sredstva PROPHYL® S so biorazgradljive skladno z določili odstavka pet (5) priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22) (dokazila o biorazgradljivosti komponent Virocida so v prilogi 2 k temu dokumentu). Skladno z navedenim dezinfekcijsko sredstvo PROPHYL® S ni zadevna nevarna snov.	Ni relevantno.

1.korak: seznam nevarnih snovi					2.korak: določitev seznama zadevnih nevarnih snovi							3.korak: možnost onesnaženja tal in podzemne vode na območju IED naprave		
Trgovsko ime snovi ali zmesi	Kemijsko ime snovi	CAS št. snovi	Vsebnost snovi [%]	H stavki snovi ali zmesi	Agregatno stanje pri 20 °C [G, L, S] <sup>(1)</sup>	Topnost, hidrofobnost, hlapnost mobilnost	Obstojnost (P) Bioakumulativnost (B) Strupenost za vodne organizme (T)  Kancerogenost (C) Mutagenost (M) Strupenost za reprodukcijo (R)  ( <sup>2</sup> )	Skupina po Prilogi 3 Uredbe IED	Letna prisotnost snovi ali zmesi (kg/leto)	Zadevna nevarna snov (DA/NE)	Skupina presega prag iz priloge 3 Uredbe IED (DA/NE) <sup>(3)</sup>	Predmet IP (DA/NE) <sup>(4)</sup>	Obrazložitev	Oznaka zadevne nevarne snovi
1.	2.	3.	4.	5.	6. <sup>(1)</sup>	7.	8. <sup>(2)</sup>	9.	10.	11.	12. <sup>(3)</sup>	13. <sup>(4)</sup>	14.	15.
DESANT modra vaba	Nima. Gre za zmes. Aktivna snov je Brodifakum	56073-10-0	0,005	H360D, H373	S	hidrofobnost	T	2	3	NE	NE	NE	Deratizacijska sredstva se uporablja v sklopu vzdrževanja stavb oz. tehnoloških enot. Med zadevne nevarne snovi se ne uvrščajo nevarne snovi, ki se uporabljajo za vzdrževanje stavb in tehnoloških enot (zadnji odstavek priloge 3 Uredbe o vrsti dejavnosti in naprav, ki povzročajo industrijske emisije (Ur. l. RS, št. 68/22)). Skladno z navedenim se deratizacijsko sredstvo DESANT modra vaba ne obravnava kot zadevna nevarna snov.	Ni relevantno.
Dizelsko gorivo	Dizelsko gorivo (ogljikovodiki z verigo ogljikovih atomov C <sub>9</sub> do C <sub>20</sub> )	269-822-7	93	H226, H304, H315, H351, H373, H411	L	hidrofobnost	/	2	216,7*	NE	NE	NE	Skladno z zadnjim odstavkom priloge 3 Uredbe IED se med zadevne nevarne snovi ne uvrščajo nevarne snovi v nepremičnih motorjih z notranjim izgorevanjem za zasilno napajanje v trajanju manj kot 300 ur na leto ali v rezervoarjih za gorivo v tovornih vozilih in delovnih strojih, ki se uporabljajo za njihovo delovanje ali za namene delovanja njihove opreme, če so za tovorna vozila in delovne stroje zagotovljeni redni predpisani tehnični pregledi, s katerimi se izkazuje njihova tehnična brezhibnost. Ne glede na stavke o nevarnosti iz zgornje tabele se tekoča goriva, ki niso zajeta v prejšnji stavek, uvrščajo v skupino 4 navedene priloge.	Ni relevantno.
Utekočinjen naftni plin (UNP)	Nima. Gre za zmes plinov: - propana - butan - buta-1,3-dien	Zmes nima CAS št. 106-97-8 74-98-6 106-99-0	65 35 <0,1	H220, H280	L (utekočinjen plin - G)	Zelo hlapno	/	/	50.000	NE	NE	NE	Skladno z zadnjim odstavkom priloge 3 (pragovi letne prisotnosti zadevnih nevarnih snovi) Uredbe IED se med zadevne nevarne snovi ne uvrščajo nevarne snovi, ki se uporabljajo za ogrevanje stavb. Glede na navedeno se utekočinjeni naftni plin (UNP) ne uvršča med zadevne nevarne snovi.	Ni relevantno.

(1) Pomen kratic: G – plin (Gas)  
L – tekoče (Liquid)  
S – trdno (Solid)

(2) Preverite ali je snov ali zmes na seznamu SVHC snovi in v kolikor da, to vpišite v stolpec 8.

(3) Opomba: Če IED naprava leži na vodovarstvenem območju, ugotavljanje, ali skupina presega prag letne prisotnosti ni potrebno – stolpca ni treba izpolniti.

(4) Opomba: Če IED naprava leži na vodovarstvenem območju, so opredeljene zadevne nevarne snovi (stolpec 11) predmet IP ne glede na pragove iz priloge 3 Uredbe IED. V kolikor nevarna snov ni opredeljena kot zadevna nevarna snov, ni predmet nadaljnjega postopka IP.

## **Priloga 2:**

Dokazila o biorazgradljivosti sestavnih komponent  
**dezinfekcijskega sredstva PROPHYL® S**

### **Sestavine so:**

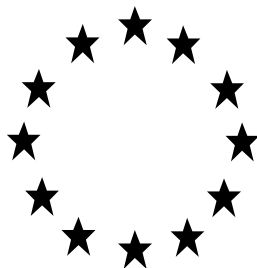
- klorokrezol,
- natrijev C14-17 alkil sec-sulfonat,
- glikolna kislina.



# Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products

*Evaluation of active substances*

## Assessment Report



## Chlorocresol (CMK)

Product-type PT 13  
(Metalworking-fluid preservatives)

April 2016 ; Revised November 2017

France

- application, when the metal working is automated and the professional wears gloves and impermeable coverall during maintenance and other tasks or when this task is completely automated in order to reduce exposure,
- sump maintenance, with gloves and coveralls,
- fluid monitoring, without PPE.

For combined exposure, the risk is considered to be acceptable for operators during:

- preparation of 6%-CMK solution, with the wear of gloves, coverall, mask and low containment level during big bag unloading
- addition of 6%-CMK solution in the MWF circuit, when this task is manual with impermeable coverall and gloves, semi-automated (without PPE) or when this task is completely automated,
- application, when the professional wears gloves and impermeable coverall or when this task is completely automated in order to reduce exposure,
- fluid monitoring, without PPE.

The sump maintenance is excluded of this calculation as it occurs only once a month and as its duration is short (4 hours).

This risk of skin and eye irritation/sensitization and/or respiratory irritation from CMK, can be readily controlled through the use of proper risk mitigation measures when handling concentrated formulations. Therefore, packaging, equipment and procedures, e.g. automated dosing systems, should be designed to prevent exposure as much as possible. Moreover, effective skin protection such as gloves, goggles, protective coveralls and boots is required under all the identified scenarios for use of CMK based products. Additionally, the use of concentrated formulations is restrained to professional operators. MSDS and product use instructions shall inform the users of the potential risks and prevention measures.

By using adapted processes, protective equipment and respecting good professional practices, the local exposure potential to CMK based products can be avoided and the risk of adverse health effects can be reduced to an acceptable level.

During the metalworking process the end-use concentration of CMK would not be classified for local effects and so a local risk assessment is not necessary.

### **2.5.3. Environmental Risk Assessment**

#### **2.5.3.1. Fate and distribution in the environment**

##### **2.5.3.1.1. Abiotic degradation**

###### **2.5.3.1.1.1. Hydrolysis as a function of pH**

CMK is stable to hydrolysis at pH values of 4, 7 and 9 (50° C). Therefore, it is not to be expected that hydrolytic processes will contribute to the degradation of CMK in the aquatic environment.

###### **2.5.3.1.1.2. Photolysis in water**

A photodegradation study has been provided but it has not been considered acceptable by RMS due to numerous deficiencies such as the absence of irradiation apparatus description. Nevertheless, according to absorbance properties (maximum absorbance at 228 and 281 nm), p-chloro-m-cresol is expected to be stable to the photolysis in water.

**2.5.3.1.1.3. Photolysis in air**

Calculations of the chemical lifetime in the troposphere by the AOPWIN program<sup>9</sup> resulted in a half-life of 0.625 days, corresponding to 14.995 hours, considering an OH-radicals concentration of  $0.5 \times 10^6 \text{ molec.cm}^{-3}$  and 24 hour). Therefore, CMK should be rapidly degraded by photochemical processes and neither accumulation in the air nor transport over longer distances is expected.

**2.5.3.1.1.2. Biodegradation**

No key study dealing with the degradation of CMK in STP has been provided. However supportive simulation studies, monitoring reports and publications indicate that an efficient elimination of CMK occurs in industrial as in domestic STPs. Considering that CMK is readily biodegradable (10-day window fulfilled), a half-life of 0.03 days has been applied for STP compartment for the exposure calculation.

Two studies concerning the biodegradation in water sediment systems have been provided. The first one shows that the dissipation of CMK is rapid in the whole system ( $DT_{50, 12^\circ\text{C}} \leq 3.6 \text{ d}$ ) as in the water phase ( $DT_{50, 12^\circ\text{C}} \leq 3.3 \text{ d}$ ). The mineralization rate was over 20% and the bound residues remained below 55%. This first study clearly indicates that no extractable metabolite occurred over 10% in the sediment. As the picture was less clear for the metabolite in the water phase, a further study has been provided in order to better separate and quantify the metabolites. This second study allows confirming that no metabolite of concern occurred in the water phase, the only metabolite near the threshold of 10% being phenol (9.9 % of applied radioactivity). A non-key laboratory study and analysis of sediment and water in German rivers support the high aerobic biodegradation rate in aquatic compartment. Additionally, several insights dealing with the metabolic pathway of CMK in water have been provided.

Only supportive data have been provided for the assessment of the degradation of CMK in soil and default degradation value from the TGD<sup>10</sup> for a readily biodegradable substance has been therefore applied to calculate concentrations of CMK in soil ( $DT_{50}$ : 30 days).

**2.5.3.1.1.3. Mobility**

A batch equilibrium study allows to derive an organic carbon-water partition coefficient ( $K_{oc}$ ) value of  $195.6 \text{ L.kg}^{-1}$  (arithmetic mean  $K_{oc}$  value for the tested soils where the recovery was sufficient, which was supported by an HPLC test ( $K_{oc} = 158.5 \text{ L.kg}^{-1}$ ).

Besides, a publication indicates a low leaching ability of CMK in soil, (CMK found in only one of 41 soil pore samples from three sites in USA).

**2.5.3.1.1.4. Bioaccumulation**

For CMK, a log  $K_{ow}$  value of  $3.02$  at  $22 \pm 1^\circ\text{C}$  has been determined. Calculating the BCF for CMK on the basis of this partition coefficient n-octanol/water according to the Guidance document on Risk Assessment, a  $BCF_{fish}$  of 73.6 was assessed. This value is in good accordance with the supportive experimental data ( $5.5\text{-}121 \text{ L.kg}^{-1}$ ). These results indicate a low potential of CMK to bioaccumulate in the aquatic food chain. For the terrestrial compartment, a  $BCF_{earthworm}$  of 13.41 has been calculated according to the Guidance document on Risk Assessment.

Taking into consideration these low bioconcentration factors, no food chain concern is expected.

<sup>9</sup> v. 1.91, 2000, US-EPA

<sup>10</sup> European Commission (2003): Technical Guidance Document on Risk Assessment. European Commission Joint Research Centre, EUR 20418

Photolytic / photo-oxidative degradation of active substance and resulting relevant metabolites	Not relevant (absorbance < 290 nm)
Readily biodegradable (yes/no)	Yes (4% of degradation at 5 days, 79% at 15 days, 10-day window fulfilled)
Inherent biodegradable (yes/no)	Yes (after 35 days of acclimation, 78% of degradation reported at 28 days).
Biodegradation in freshwater	No data
Biodegradation in seawater	Not relevant (no use in the marine environment).
Non-extractable residues	<u>Water sediment system</u> maximum 54.2-54.3 % at 28-14 days, 46.4-52.4% at the end of the study (35d)
Distribution in water / sediment systems (active substance)	DT <sub>50 whole system</sub> = 1.22-1.90 days at 20°C (dissipation) DT <sub>50 whole system</sub> = 2.31-3.60 days at 12°C (dissipation) <u>Endpoint for the risk assessment (worst case of two values): DT<sub>50 whole system</sub> = 3.60 days at 12°C</u>
Distribution in water / sediment systems (metabolites)	Not identified radioactivity Water: maximum 27-32.7% at 3-4 days, 2.4-17.8% at the end of the study (35d). A complementary study allowed to state that 7 different metabolites contribute to this not identified radioactivity. Only one metabolite, identified as phenol amounted to 9.9% of the initial applied radioactivity and has been considered as metabolite of concern. Sediment: not relevant (<10%) DT <sub>50 whole system</sub> = 6.97-36.4 days at 20°C DT <sub>50 whole system</sub> = 13.22-71.95 days at 12°C

**Route and rate of degradation in soil**

Mineralization (aerobic)	No key study available
Laboratory studies (range or median, with number of measurements, with regression coefficient)	No key study available. A default value based on the ready biodegradation test is assumed: DT <sub>50</sub> = 30 days.
DT <sub>50lab</sub> (20°C, aerobic):	
DT <sub>90lab</sub> (20°C, aerobic):	
DT <sub>50lab</sub> (10°C, aerobic):	
DT <sub>50lab</sub> (20°C, anaerobic):	
degradation in the saturated zone:	

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REACH

# Sulfonic acids, C14-17-sec-alkane, sodium salts

EC number: 307-055-2 | CAS number: 97489-15-1



Environmental fate & pathways

**Biodegradation in water and sediment: simulation tests**

001 Key | Experimental result

## Administrative data

Endpoint:	biodegradation in water: sewage treatment simulation testing
Type of information:	experimental study
Adequacy of study:	key study
Study period:	1991
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	other: fehlt noch

## Data source

Reference	
Reference Type:	study report
Title:	Unnamed
Year:	1991
Report date:	1991

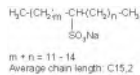
## Materials and methods

Test guideline	
Qualifier:	according to guideline
Guideline:	OECD Guideline 303 A (Simulation Test - Aerobic Sewage Treatment. A: Activated Sludge Units)
GLP compliance:	no

## Test material

Test material information	
Constituent 1	
Reference substance name:	<a href="#">Hostapur SAS 93</a>
IUPAC Name:	Hostapur SAS 93

## Constituent 2



Reference substance name:	<a href="#">Sulfonic acids, C14-17-sec-alkane, sodium salts</a>
EC Number:	307-055-2
EC Name:	Sulfonic acids, C14-17-sec-alkane, sodium salts
Cas Number:	97489-15-1
Molecular formula:	H3C-(CH2)m-CH-(SO3Na)-(CH2)n-CH3
IUPAC Name:	Sulfonic acids, C14-17-sec-alkane, sodium salts

Details on test material:	<ul style="list-style-type: none"><li>- Name of test material (as cited in study report): Hostapur SAS 93</li><li>- Physical state: solid</li><li>- Analytical purity: 93%</li><li>- Composition of test material, percentage of components: 100% Hostapur SAS 93</li><li>- Lot/batch No.: no data</li></ul>
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## Study design

Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, domestic, non-adapted
Details on inoculum:	<ul style="list-style-type: none"><li>- Source of inoculum/activated sludge (e.g. location, sampling depth, contamination history, procedure): activated sludge collected from a treatment works receiving predominantly domestic sewage (sewage treatment plant Niederrad)</li></ul>
Duration of test (contact time):	48 d

### Initial test substance concentration

#### Initial test substance concentration 1

Initial conc.:	1 other: L/h
Based on:	test mat.

#### Initial test substance concentration 2

Initial conc.:	5 - 20 mg/L
Based on:	other: Carbon

Parameter followed for biodegradation estimation:	DOC removal
Details on study design:	<p>TEST CONDITIONS</p> <ul style="list-style-type: none"><li>- Composition of medium: synthetic wastewater with nutrient solutions according to OECD Guideline</li></ul> <p>TEST SYSTEM</p> <ul style="list-style-type: none"><li>- Culturing apparatus: OECD confirmatory test apparatus</li><li>- Number of culture flasks/concentration: 1</li></ul>

## Results and discussion

### % Degradation

% Degr.:	96.2
St. dev.:	2.55
Parameter:	DOC removal
Sampling time:	34 d

Transformation products:	not measured
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## Applicant's summary and conclusion

Conclusions:	A biological degradation of $96.2 \pm 2.55$ % was reached after the initial 14-day equilibration period, where increasing amounts of test item were added to the test system.
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Executive summary:



The ultimate biodegradability of Sulfonic acids, C13-17-sec-alkane, sodium salts was assessed in the aerobic sewage treatment simulation test using activated sludge units (OECD 303A). After the initial 14-day equilibration period, where increasing amounts of test item were added to the test system, a degradation of  $96.2 \pm 2.55\%$  was achieved throughout the study period, as determined by daily DOC measurements over 34 days.

These results indicate that Sulfonic acids, C13-17-sec-alkane, sodium salts can be regarded as well biodegradable under conditions of the test.

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REACH

# Glycollic acid

EC number: 201-180-5 | CAS number: 79-14-1



Environmental fate & pathways

## Biodegradation in water: screening tests

S-01 | Summary

### Administrative data

### Link to relevant study record(s)

### Reference

Reference 1	
Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	guideline study with acceptable restrictions
Qualifier:	equivalent or similar to guideline
Guideline:	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
GLP compliance:	no
Oxygen conditions:	aerobic
Inoculum or test system:	not specified
Duration of test (contact time):	28 d
Initial conc.:	10 mg/L
Based on:	test mat.
Parameter followed for biodegradation estimation:	O2 consumption
Reference substance:	acetic acid, sodium salt
Preliminary study:	The Theoretical Oxygen Demand (TOD) of glycolic acid was calculated as 0.5 mg O2 per mg of test substance.
Value:	89.6
Sampling time:	7 d
Details on results:	No further information.
Results with reference substance:	Biodegradation of the control chemical, sodium acetate, exceeded 60% within 14 days Glycolic acid reached 89.6% biodegradability after 7 days and the test was stopped. So, biodegradability was > 60% within 28 days and that this level of biodegradability was achieved within 14 days of exceeding the 10% level of biodegradability.
Validity criteria fulfilled:	yes
Remarks:	The biodegradation of the control chemical, sodium acetate, exceeded 60% within 14 days, therefore the test is considered valid.

Interpretation of results:	readily biodegradable
Executive summary:	The biodegradability of glycolic acid was investigated using the OECD 301D guideline (Closed bottle test). Glycolic acid is classified as readily biodegradable. After 7 days, 89.6% of the test material was biodegraded. A minimum 60% biodegradability is required to pass this test. In addition, the "pass level" of 60% must be reached within a 14-day window after exceeding the 10% level.

## Reference 2

Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	guideline study with acceptable restrictions
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
Version / remarks:	; Modified Sturm test
GLP compliance:	no
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, domestic (adaptation not specified)
Details on inoculum:	Activated sludge collected from the City of Wilmington POTW was used as the inoculum
Duration of test (contact time):	28 d
Initial conc.:	71.7 other: µL/L
Based on:	test mat.
Parameter followed for biodegradation estimation:	CO2 evolution
Details on study design:	The study meets the recommended guideline (EC methods C.4 A to F or the corresponding OECD 301 A to F guidelines).
Reference substance:	benzoic acid, sodium salt
Parameter:	% degradation (CO2 evolution)
Value:	78
Sampling time:	11 d
Results with reference substance:	In the presence of glycolic acid and the reference substance, sodium benzoate, greater than 25% biodegradation was observed within 14 days.
Validity criteria fulfilled:	yes
Remarks:	Sodium benzoate (the positive control chemical) was >=60% biodegraded within 4 days, therefore the test is considered valid.
Interpretation of results:	readily biodegradable
Conclusions:	The test material (glycolic acid) reached a peak of 78% biodegradability at day 11. Glycolic acid is classified as readily biodegradable since biodegradability was > 60% within a 10-day window after exceeding the 10% level of biodegradability.
Executive summary:	<p>The biodegradability of glycolic acid was investigated using the OECD 301B guideline (Modified Sturm test).</p> <p>Biodegradability was &gt; 60% within the 10 day window after exceeding the 10% level of biodegradability. In the presence of glycolic acid and the reference substance, sodium benzoate, greater than 25% biodegradation was observed within 14 days. Therefore glycolic acid is not considered as inhibitory to microorganisms in the inoculum.</p> <p>Glycolic acid is classified as readily biodegradable (and passing the 10-day window).</p>

## Reference 3

Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	key study
Study period:	5 January to 21 April, 2021
Reliability:	1 (reliable without restriction)
Rationale for reliability incl. deficiencies:	guideline study
	according to guideline

Qualifier:	
Guideline:	OECD Guideline 310 (Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test))
Version / remarks:	26 September, 2014
Deviations:	no
GLP compliance:	yes (incl. QA statement)
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, domestic, non-adapted
Details on inoculum:	<p>Origin: Activated sludge, microorganisms from a domestic wastewater treatment plant were supplied by a municipal sewage treatment plant (Rossdorf, Germany).</p> <p>Conditioning: The activated sludge was used as collected, but coarse particles were removed by settling for a short period (15 minutes) and the supernatant liquid phase was decanted. The solid material was re-suspended in test water and again centrifuged. This procedure was repeated three times. An aliquot of the final sludge suspension was weighed, dried and the ratio of wet sludge to its dry weight was determined. Based on this ratio, calculated aliquots of washed sludge suspension were mixed with test water, corresponding to 4 g dry material per litre.</p>
Duration of test (contact time):	28 d
Initial conc.:	31.7 mg/L
Based on:	TOC
Remarks:	10.0 mg carbon per litre, based on an organic carbon content of 0.316 mg carbon/mg test item
Parameter followed for biodegradation estimation:	CO2 evolution
Details on study design:	<p>Test units and conditions: Tests were conducted in glass bottles with screw-caps and Teflon-coated septa (125 mL nominal, 128 mL total volume) in a controlled environment room (20 - 21°C) in the dark. The pH value of the test water was 7.6. The activated sludge was aerated with CO2-free air prior to test start. Test conditions were recorded with suitable instruments and documented in the raw data.</p> <p>Test solutions preparation: Test Item: 79.29 mg test item was weighed into a total volume of test water (2500 mL) and activated sludge (2.5 mL of a stock solution of 4 g/L suspended solids) was added to achieve a concentration of 4 mg/L suspended solids in test water. The mixture was stirred intensively, and appropriate amounts were dispensed into the test vessels and sealed with gas-tight septum caps. Inoculum Control: Activated sludge (2.5 mL of a stock solution of 4 g/L suspended solids) were added to the test water (2500 mL) to achieve a concentration of 4 mg/L suspended solids in test water. The mixture was stirred intensively, and appropriate amounts were weighed into the test vessels and sealed with gas-tight septum caps. Procedure Control: 25.74 mg reference item sodium benzoate was weighed into a total volume of test water (1500 mL) and activated sludge (1.5 mL of a stock solution of 4 g/L suspended solids) was added to achieve a concentration of 4 mg/L suspended solids in test water. The mixture was stirred intensively, and appropriate amounts were weighed into the test vessels and sealed with gas-tight septum caps. Toxicity Control: The toxicity control contained both the test item and the reference item. 47.64 mg test item and 25.86 mg reference item were weighed into a total volume of test water (1500 mL) and activated sludge (1.5 mL of a stock solution of 4 g/L suspended solids) was added to achieve a concentration of 4 mg/L suspended solids in test water. The mixture was stirred intensively, and appropriate amounts were weighed into the test vessels, containing the evaporated test item and sealed with gas-tight septum caps. Sodium Hydroxide Solution 7M: To avoid an additional background carbon entry via the Sodium hydroxide solution, two additional flasks with Sodium hydroxide solution were prepared at each sampling date. The measured inorganic carbon content of the test flasks were corrected by this blank value.</p> <p>Headspace to Liquid Ratio: 1:2 Test Item Loading Rate: 31.7 mg test item/L (10.0 mg carbon per litre, based on an organic carbon content of 0.316 mg carbon/mg test item). Reference Item Loading Rate: 17.2 mg/L (10.0 mg carbon per litre, based on an organic carbon content of 0.583 mg carbon/mg reference item). Test Item and Reference Item Loading Rate for Toxicity Control: 31.8 mg test item/L (10.0 mg carbon per litre) and 17.2 mg reference item /L (10.0 mg carbon per litre).</p> <p>Course of the test: Three replicates per treatment and per sampling were prepared. For the day 28 sampling totally 5 replicates per treatment were prepared. For the test item and inoculum control test solutions, samples were taken on days 0, 3, 6, 10, 13, 17, 20, 28 and on days 0, 6, 13, 28 for the procedure control and toxicity control solutions. Test vessels were shaken during the incubation time until sampling.</p> <p>Sampling Procedure: The produced CO2 was converted into carbonate using 7M NaOH solution (0.8 mL to 85 mL test medium) injected into the test vessels at each sampling. The alkalisied medium was shaken for 1 hour and subjected to TIC (total inorganic carbon) analysis. The analysis was done immediately after sampling or the alkalisied samples were stored in the refrigerator (4±4°C) for a maximum of 7 days. The same sodium hydroxide solution used for alkalisiation was used within the experiment. The TIC (total inorganic carbon) of that solution was between 0.71 and 3.27 mg TIC/L (mean).</p> <p>Determination of evolved CO2 (TIC) by TOC-analyser: The total inorganic carbon content (TIC) consists of the carbon contained in carbonates and in carbon dioxide dissolved in water. By acidifying the sample with a small amount of hydrophosphoric acid to obtain a pH less than 3, all carbonates were converted to carbon dioxide. Carbon dioxide and dissolved carbon dioxide in the sample were volatilized by bubbling CO2-free air through the sample and flushed by the carrier air into the detector of the TOC analyser. The TIC-content was analysed automatically using the sealed test vessels as sampling vials.</p>
Reference substance:	benzoic acid, sodium salt

Preliminary study:	Not applicable
Test performance:	<p>The mean amounts of TIC present in the inoculum controls at the end of the test was 0.34 mg C/L, therefore fulfilling this validity criteria (i.e. &lt; 3 mg C/L (after correction with NaOH-solution)).</p> <p>The toxicity control showed 86.9% biodegradation within 13 days and 81.7% biodegradation after 28 days of incubation, therefore concluding that the test item is non-inhibitory.</p>
	Key result
Parameter:	% degradation (CO2 evolution)
Value:	83.9
Sampling time:	28 d
Parameter:	% degradation (CO2 evolution)
Value:	63.4
Sampling time:	3 d
Details on results:	<p>The mean degradation of Glypure™ 99 was 63.4% at the first post-initiation measurement made on day 3 and simultaneously exceeded both the 10% degradation threshold and the 60% trigger for classification as readily biodegradable. In this situation, and as the first measurement was made after fewer than 10 days, the 10- day window further consideration of the 10-day window is not necessary. Subsequently, the degradation of Glypure™ 99 reached plateau phase by day 6 and remained constantly high for the remainder of the test. Degradation was 83.9% at test end at day 28.</p>
Results with reference substance:	<p>The reference item (sodium benzoate) was sufficiently degraded to 78.9% after 13 days and to 85.9% after 28 days of incubation, thereby confirming the suitability of the used aerobic activated sludge inoculum and fulfilling this validity criteria (i.e. &gt;60% biodegradation by day 14).</p>

#### Inorganic Carbon produced in Test Flasks during the Test Period of 28 Days

Treatment	C-content [mg/L]	Replicate	Day							
			0	3	6	10	13	17	20	28
			TIC [mg/L]							
Control	—	1	0.00	0.00	1.40	0.00	0.36	0.70	0.51	0.43
		2	0.00	0.00	1.36	0.00	2.07	0.46	0.28	0.35
		3	0.00	0.00	1.37	0.00	0.79	0.54	0.39	*
		4	—	--	--	—	—	—	--	0.27
		5	—	--	--	—	—	—	--	0.32
		Mean	0.00	0.00	1.38	0.00	1.07	0.56	0.39	0.34
Na-benzoate	10.000	1	0.34	--	9.48	—	10.76	—	--	8.71
		2	0.55	--	7.92	—	10.47	—	--	9.31
		3	0.61	--	7.87	—	6.28	—	--	10.16
		4	—	--	--	—	—	—	--	8.04
		5	—	--	--	—	—	—	--	9.45
		Mean	0.50		8.43		9.17			9.13
Glypure glycolic acid 99	10.024	1	0.00	5.34	10.69	7.25	9.78	8.77	8.32	8.34
		2	0.00	9.09	9.43	6.64	10.01	8.09	8.37	8.83
		3	1.60	4.63	10.28	7.28	9.08	8.53	8.52	9.25
		4	—	--	--	—	—	—	--	8.51
		5	—	--	--	—	—	—	--	8.80
		Mean	0.53	6.35	10.14	7.06	9.62	8.46	8.40	8.75
Toxicity control	20.082	1	1.15	--	15.41	—	19.29	—	--	15.62
		2	0.47	--	15.47	—	18.99	—	--	18.07
		3	0.78	--	15.35	—	17.27	—	--	15.99
		4	—	--	--	—	—	—	--	17.00
		5	—	--	--	—	—	—	--	17.01
		Mean	0.80		15.41		18.52			16.74
NaOH-solution		1	1.71	1.62	1.39	3.96	1.49	0.77	0.81	1.65
		2	1.10	4.92	1.51	1.49	1.70	0.66	0.72	1.45
		Mean	1.41	3.27	1.45	2.72	1.59	0.71	0.77	1.55

1: corrected by blank value of the NaOH-solution --: not applicable; \*: flask could not be measured due to technical reasons

#### Biodegradation of Test Item, Reference Item and Toxicity Control during the Test Period of 28 Days

Treatment	C-content [mg/L]	Replicate	Day							
			0	3	6	10	13	17	20	28
			% biodegradation [net measured TIC / initial C x 100] [mg/L]							
Na-benzoate	10.000	1	3.3	--	79.2	—	94.4	--	—	81.8
		2	5.3	--	63.9	—	91.6	--	—	87.6
		3	6.0	--	63.4	—	50.7	--	—	95.9
		4	—	--	--	—	—	--	—	75.3
		5	—	--	--	—	—	--	—	89.0
		Mean	4.9		68.8		78.9			85.9

Glypure glycolic acid 99	10.024	1	0.0	53.2	92.9	72.4	86.9	81.9	79.1	79.8
		2	0.0	90.7	80.3	66.2	89.2	75.2	79.6	84.7
		3	16.0	46.2	88.8	72.6	79.9	79.5	81.1	88.9
		4	–	--	--	–	–	--	–	81.5
		5	–	--	--	–	–	--	–	84.4
		Mean	5.3	63.4	87.3	70.4	85.3	78.9	79.9	83.9
Toxicity control	20.082	1	5.7	--	69.9	–	90.7	--	–	76.1
		2	2.3	--	70.2	–	89.2	--	–	88.3
		3	3.9	--	69.6	–	80.7	--	–	77.9
		4	–	--	--	–	–	--	–	83.0
		5	–	--	--	–	–	--	–	83.0
		Mean	4.0		69.9		86.9			81.7

1: corrected by the inoculum control; --: not applicable

Validity criteria fulfilled:	yes
Interpretation of results:	readily biodegradable
Conclusions:	The mean degradation of Glypure™ 99 was 63.4% at day 3, thereby simultaneously exceeding both the 10% degradation threshold and the 60% trigger for classification as readily biodegradable. The mean biodegradation of Glypure™ 99 was 83.9% at day 28.
Executive summary:	<p>The ready biodegradability of Glypure™ 99 was investigated in a CO<sub>2</sub> headspace test over a period of 28-days, according to OECD Guideline 310.</p> <p>Biodegradation was determined by following the CO<sub>2</sub> evolution of the test item in the incubation flasks during exposure. As a reference item, sodium benzoate was tested simultaneously under the same conditions as the test item, functioning as a procedure control. In addition, an inoculum control and a toxicity control were also tested simultaneously under the same test conditions. The degradation rate of the test item is calculated by the CO<sub>2</sub> evolution of the aerobic activated sludge microorganisms by measuring the inorganic carbon in the test flasks corrected by control vessels.</p> <p>Sodium benzoate was sufficiently degraded to 78.9% after 13 days and to 85.9% after 28 days of incubation, thereby confirming the suitability of the used aerobic activated sludge inoculum and fulfilling this validity criteria (i.e. &gt;60% biodegradation by day 14). The mean amounts of TIC present in the inoculum controls at the end of the test was 0.34 mg C/L, therefore fulfilling this validity criteria (i.e. &lt; 3 mg C/L (after correction with NaOH-solution)). The toxicity control showed 86.9% biodegradation within 13 days and 81.7% biodegradation after 28 days of incubation, therefore concluding that the test item is non-inhibitory.</p> <p>The mean degradation of Glypure™ 99 was 63.4% at day 3, thereby simultaneously exceeding both the 10% degradation threshold and the 60% trigger for classification as readily biodegradable. The mean biodegradation of Glypure™ 99 was 83.9% at day 28.</p>

Description of key information

Studies assessing the ready biodegradability of glycolic acid are available, with the key (most reliable) study resulted in 83.9% degradation (based on CO<sub>2</sub> evolution) after 28 days, meeting the 10-day window (Hammesfahr, 2021a). Glycolic acid is therefore concluded to be ready biodegradability. This key study was GLP compliant and met all validity criteria of the study guidelines followed (OECD Guideline 310 and ISO 14593).

Key value for chemical safety assessment

Biodegradation in water:	readily biodegradable
Type of water:	freshwater

Additional information

Glycolic acid is classified as readily biodegradable.

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### **Priloga 3:**

Dokazila o biorazgradljivosti sestavnih komponent  
**dezinfekcijskega sredstva Virocid™**

#### **Sestavine so:**

- alkildimetil benzalkonijev klorid,
- didecildimetilamonijevklorid,
- glutaraldehid in
- izopropanol.

Zapri

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REACH

# Quaternary ammonium compounds, benzyl C12-C16 (even numbered)-alkyldimethyl chlorides

EC number: 939-253-5 | CAS number: 68424-85-1

Environmental fate & pathways

## Biodegradation in water: screening tests

S-01 | Summary

### Administrative data

### Link to relevant study record(s)

#### Reference

Reference 1	
Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	key study
Study period:	From March 16, 1992 to April 20, 1992
Reliability:	1 (reliable without restriction)
Rationale for reliability incl. deficiencies:	guideline study
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Deviations:	yes
Remarks:	slight inoculum modification
GLP compliance:	yes (incl. QA statement)
Oxygen conditions:	aerobic
Inoculum or test system:	other: Secondary activated sludge was used
Details on inoculum:	A minor deviation of the test procedures described in the guidelines was introduced: instead of an effluent/extract/mixture, activated sludge was used as an inoculum. The activated sludge was preconditioned to reduce the endogenous respiration rates. To this end the sludge (200 mg Dry Weight (DW)/L) was aerated for one week. The sludge was diluted to a concentration of 2 mg DW/L in the BOD bottles. This method was described in a proposal for harmonizing ready biodegradability test protocols.
Duration of test (contact time):	28 d
Initial conc.:	4 mg/L
Based on:	test mat.
Parameter followed for biodegradation estimation:	O2 consumption
Details on study design:	- The closed bottle test was performed according to the EEC, OECD and ISO Test Guidelines. Ten bottles containing

only inoculum, 10 bottles containing test substance and inoculum, and 10 bottles containing sodium acetate and inoculum were used. The concentrations of the test compound and sodium acetate in the bottle were 4.0 and 6.7 mg/L, respectively. The inoculum was diluted to 2 mg DW/L in the closed bottles. Each of the prepared solutions was dispensed into the respective group of BOD bottles so that all bottles were completely filled without air bubbles. The zero time bottles were immediately analysed for dissolved oxygen using an oxygen electrode. The remaining bottles were closed and incubated at 21°C in the dark.

- Two duplicate bottles of all series were withdrawn for analyses of the dissolved oxygen concentration at Day 7, 14, 21 and 28. One extension from the protocol of the closed bottle test was introduced.

Reference substance:	acetic acid, sodium salt
Key result	
Parameter:	% degradation (O <sub>2</sub> consumption)
Value:	63
Sampling time:	28 d
Details on results:	<p>The test was conducted in the presence of silica gel due to toxicity to inoculum.</p> <p>The validity of the test was demonstrated by an endogenous respiration of 1.3 mg/L at Day 28.</p> <p>Furthermore, the differences of the replicate values at Day 28 were less than 20%.</p> <p>The biodegradation percentage of the reference compound, sodium acetate, at Day 14 was 78.</p> <p>The validity of the test was shown by oxygen concentrations being &gt;0.5 mg/L in the bottles.</p>
Results with reference substance:	The biodegradation percentage of the reference compound, sodium acetate, at Day 14 was 78.

Table 1. Biodegradation percentages (%)

	Test substance	Reference substance
0	0	0
7	1	69
14	50	78
21	66	86
28	63	88

#### Nitrification corrections:

Ammonium chloride is omitted from the medium to prevent oxygen consumption by nitrifying bacteria increasing the endogenous oxygen consumption in the BOD bottles. The reason for this omission is the goal to lower the endogenous respiration thereby increasing the accuracy of the assessment of the biodegradability. This goal is reflected in the validity criterion of less than 1.5 mg/L of oxygen consumption in the control bottles at day 28. Omission of ammonium should not hamper the biodegradation of organic compounds in the Closed Bottle test. The biodegradation of the reference substance (sodium acetate) does demonstrate that nitrogen is not limiting growth. The nitrogen introduced with the inoculum is sufficient to fulfill the nitrogen requirement of the microorganisms.

Nitrification of the nitrogen present in test substance itself could occur. This could be a reason for using the ThOD<sub>NH3</sub>. Using the ThOD<sub>NH3</sub> of 1.52 g/g would result in a biodegradation percentage of 57.4, not allowing classification as readily biodegradable.

	Molecular formula	MW	ThOD <sub>NH3</sub> (g/g)	ThOD <sub>NH3</sub> (g/g)	Weight (%)
C12-16 ADBAC (n= C12)	C <sub>21</sub> H <sub>38</sub> NCI	340	2.78	2.96	0.501
Water	H <sub>2</sub> O	18	0	0	0.488
Amines	C <sub>16</sub> H <sub>35</sub> N	241.46	3.18	3.45	0.011
The ThOD <sub>NH3</sub> of the test substance is =					1.43
The ThOD <sub>NH3</sub> of the test substance is =					1.52

Day	O <sub>2</sub> consumption	BOD	ThOD <sub>NH3</sub>	% biodegradation	ThOD <sub>NH3</sub>	% biodegradation
7	0.1	0.025	1.43	1.8	1.52	1.6
14	2.8	0.7		49.1		46.0
21	3.7	0.925		64.9		60.7
28	3.5	0.875		61.4		57.4

Test conc: 4 mg/L

However, it is not obligatory to use ThOD<sub>NH3</sub> for all nitrogen containing test substances. The choice of the ThOD used to calculate biodegradation percentages should not be based on possible formation of nitrite or nitrate. Tests of the OECD 301 series were developed to assess the biodegradability and mineralization of organic substances. Nitrogen containing substances are biodegraded in ready biodegradability tests by heterotrophic micro-organisms capable of utilizing these substances as carbon and energy source. This usually results in the formation of

biomass (growth), water, carbon dioxide and ammonium (mineralization). The ammonium formed may subsequently be oxidized by nitrifying bacteria. These nitrifying bacteria utilizing ammonium as energy source and carbon dioxide as carbon source (autotrophic growth) are not involved in the biodegradation of nitrogen containing substances. Biodegradation percentages calculated with the  $\text{ThOD}_{\text{NH}_3}$  do therefore represent the biodegradability and mineralization of most nitrogen containing substances. The formation of nitrite and nitrate during the degradation of organic substances is rare and only occurring when organic nitrogen is for example present in the form of a nitro group. Organic nitrogen is always liberated by microorganisms as ammonium when nitrogen is present as primary amine (amino group), secondary amine group, tertiary amine or quaternary ammonium group.

Biodegradation of the C12-16 ADBACs and in general:

The test substance has a quaternary ammonium group. Benzyltrimethylamine was found as first metabolite of alkylbenzyltrimethylammonium salts degradation by *Aeromonas hydrophila*, activated sludge and a *Pseudomonas* spp. community (Patrauchan and Oriel, 2003; van Ginkel 2004; Tezelet al., 2012). Alkyl-N fission is therefore the most probable strategy to gain access to the carbon of the alkyl chain. The next step in the biodegradation of these quaternary ammonium compounds was the successive removal of the two methyl groups. Benzylamine formed, in turn, is converted into benzaldehyde and ammonium (Patrauchan and Oriel, 2003). In contrast to the alkylbenzyltrimethylammonium salts biodegradation pathway reported by Patrauchan and Oriel, (2003) neither benzyltrimethylamine nor benzylamine (BA) were identified as metabolites by two enrichment cultures. Exposure of activated sludge to decylbenzyltrimethylammonium chloride probably selects for three microorganisms that utilize the alkyl chain, the aromatic moiety, and dimethylamine (van Ginkel, 2004). Kinetic assays demonstrated that benzyltrimethylamine and benzylamine were not intermediates of alkylbenzyltrimethylammonium salts transformation by the enriched *Pseudomonas* spp. community (Tezelet al., 2012). Thus, benzyltrimethylamine is thought to be transformed to dimethylamine and benzoic acid via debenzilation. Dimethylamine is degraded by the successive removal of both methyl groups resulting in the formation of ammonium (Large, 1971). Both the pure and mixed culture studies showed that the degradation of the alkyl chain of alkylbenzyltrimethylammonium chloride results in the formation of water, carbon dioxide and ammonium (Figure).

Figure: Biodegradation pathway of alkylbenzyltrimethylammonium salts

Alkylbenzyltrimethylammonium salts are biodegraded by microorganisms first utilizing the alkyl chain. Subsequently the methyl and benzyl groups are removed. In conclusion calculation of the biodegradation percentages with the  $\text{ThOD}_{\text{NH}_3}$  is thought to be a more appropriate choice. Further, the registrant would like to point out that this study has been evaluated as a key and valid study under the biocide dossier by the RMS - Italy, which has been published by ECHA (RMS: Italy) in June 2015 (ECHA, 2015; refer to page 29). As per the assessment report, C12-16 ADBAC has been concluded to be readily biodegradable. The registrant will include the above details in the next dossier update.

#### References

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TezelU, TandukarM, MartinezRJ, SobczykPA, and PavlostathisSG (2012). Aerobic Biotransformation of n-Tetradecylbenzyltrimethylammonium chloride by an enriched *Pseudomonas* spp. community *Environ. Sci. Technol.* 46(16):8714–8722.

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· ECHA (RMS: Italy) 2015: Assessment Report: Alkyl (C12-16) dimethylbenzyl ammonium chloride, Product-type 8 (Wood preservative); Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products, Evaluation of active substances. (Biocides assessment report), Approval ID: 0063-08; Asset No: EU-0005415-0000; Rapporteur Member State: Italy. Report date: June, 2015.

Validity criteria fulfilled: yes

Interpretation of results: readily biodegradable

Conclusions: Under the conditions of the study, the biodegradation of the test substance was determined to be 63% at Day 28. The test substance was considered readily biodegradable.

Executive summary:

A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (50.1% active in water) in water according to OECD Guideline 301D (closed bottle test), in compliance with GLP. Secondary activated sludge was used in this experiment and the percentage of degradation (O<sub>2</sub> consumption) was measured. Since the substance was toxic to microorganisms, it was tested in the presence of silica gel to reduce the concentration in the water phase. During the test period, the substance was released slowly from the silica gel. The validity of the test was demonstrated by an endogenous respiration of 1.3 mg/L at Day 28. Furthermore, the differences between the replicate values at Day 28 were less than 20%. The biodegradation of the reference substance, sodium acetate, at Day 14 was 78%. Finally, the validity of the test was shown by oxygen concentrations being > 0.5 mg/L in the bottles. Under the conditions of the study, the biodegradation of the substance was determined to be 63% at Day 28. The substance was considered readily biodegradable (van Ginkel and Stroo, 1992).

## Reference 2

Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	key study
Study period:	January, 2005
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	guideline study with acceptable restrictions
Remarks:	Not GLP
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 B (Ready Biodegradability: CO <sub>2</sub> Evolution Test)
Deviations:	no
GLP compliance:	no
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, domestic, non-adapted
Details on inoculum:	>10 <sup>6</sup> CFU/mL; consisting of micro-organisms in mud collected from Station Epuration Wavre 2nd Stage, a household water treating plant. Although the inoculum concentration is unbounded, however, this is not expected to affect the overall result as can be demonstrated based on fulfillment of the validity criteria for the control group. That is, the total CO <sub>2</sub> evolution in the inoculum blank at the end of the test is 39.2 mg which is <40 mg/L medium, which is an evidence of the inoculum having a low concentration of microorganisms (not being excessive).
Duration of test (contact time):	28 d
Initial conc.:	5 other: mgC/L
Based on:	test mat.
Remarks:	Testing at low concentrations, was required due to the toxicity of the test substance towards the inoculum at higher concentrations (see section 6.1.7 of IUCLID)
Details on study design:	Test conditions: - Test temperature: 22 ± 2°C - pH: 7.3 at start and 7.8 at the end of study - Aeration of dilution water: Air free from carbon dioxide was passed through the solutions using a flow of 50 to 100 mL/min - Continuous darkness: Yes - Other: Total organic carbon content: 62.8% Test system: - Culturing apparatus: 3-litre flasks mounted with an aeration tube on a magnetic stirrer - Details of trap for CO <sub>2</sub> and volatile organics if used: the CO <sub>2</sub> produced in each flask was precipitated with Ba(OH) <sub>2</sub> . The amount of CO <sub>2</sub> produced was determined by titration.
Reference substance:	benzoic acid, sodium salt
Remarks:	20 mgC/L
	Key result
Parameter:	% degradation (CO <sub>2</sub> evolution)
Value:	95.5
Sampling time:	28 d

Details on results:	<div>- The biodegradability in the test flask was determined to be 95.5% after 28 days (See Table 1 under 'Any other information on results inc. tables').</div> <div>- The CO2 production in the blank (inoculum control) was 39.2 mg. The pH measured at the start and end of the test period was 7.3 and 7.8, respectively. The temperature throughout the test ranged from 20.8 to 21.4°C.</div>			
Results with reference substance:	The biodegradability in the reference flask was determined to be 88.9% after 28 days (See Table 1 under 'Any other information on results inc. tables and the graph under 'Illustration (picture/graph)'.			
Table 1. Biodegradability values:				
	Reference substance		Test substance	
Day	% CO2Produced	% CO2 Total	% CO2Produced	% CO2 Total
0	0.00	0.00	0.0	0.0
1	14.16	14.16	1.2	1.2
3	28.54	42.69	1.0	2.2
6	21.20	63.89	9.5	11.6
8	8.77	72.67	16.0	27.7
10	3.72	76.39	20.2	47.9
13	3.26	79.65	17.4	65.3
15	2.53	82.18	7.5	72.8
17	1.47	83.65	5.1	77.9
20	2.31	85.95	3.9	81.8
22	1.15	87.11	1.6	83.5
24	0.25	87.36	4.4	87.8
28	0.16	87.52	1.8	89.6
29	1.35	88.87	5.8	95.5
For details on results of replicates of test substance and the graphs of test and reference substances, please refer to the attachment under 'Attached background material'.				
Validity criteria fulfilled:	yes			
Interpretation of results:	readily biodegradable			
Conclusions:	Under the test conditions, the biodegradation of the test substance in water was determined to be 95.5 after 28 days (CO2 evolution). The test substance was considered to be readily biodegradable.			
Executive summary:	<p>A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (80% active in hydroalcoholic solution), in water according to OECD Guideline 301B (CO2 evolution test). Flasks containing inoculum from a household water-treating plant dosed with the equivalent of 5 mg C/L test or 20 mg C/L reference substances were maintained for 28 d. Testing at low concentrations, was required due to the toxicity of the test substance towards the inoculum at higher concentrations. Biodegradability was calculated from the released CO2 over time in the test and reference flasks compared to the blank control (a flask prepared without test or reference substance). CO2 production in the blank (inoculum control) was 39.2 mg. Biodegradability in the reference flask was determined to be 88.9% after 28 d. Under the test conditions, the biodegradation of the test substance in water was determined to be 95.5% after 28 d (CO2 evolution). The test substance was considered to be readily biodegradable (van Dievoet, 2005).</p>			

<b>Reference 3</b>	
Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Study period:	1996
Reliability:	1 (reliable without restriction)
Rationale for reliability incl. deficiencies:	guideline study
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Deviations:	no
GLP compliance:	no
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, non-adapted
Remarks:	Activated sludge domestic unadapted in river water, sea water, ditch water and soil (loam)
Details on inoculum:	<p>Secondary activated sludge and primary settled sewage were obtained from a wastewater treatment plant (WWTP) in Duiven, The Netherlands. This WWTP is an activated sludge plant treating predominantly domestic wastewater. The activated sludge used as inoculum for the Closed Bottle test was preconditioned to reduce the endogenous respiration rates. To this end, the sludge from this WWTP (200 mg dry weight/l) was aerated for one week. The sludge was diluted to a concentration of 2 mg dry weight/L in the BOD bottles. The ditch water samples were collected near Zevenaar, the</p>



	<p>Netherlands and river water samples were obtained from the river IJssel near Arnhem, the Netherlands. These samples were used immediately. Seawater was collected from coastal water near West Kapelle, the Netherlands. The seawater was aged for two weeks to reduce the concentration of biodegradable compounds present in the seawater. Loam was collected at Heino in the Netherlands. Stones and plant fragments were removed by hand. After collection, the soil was air-dried for approximately 2 days and passed through a 2 mm sieve. A small portion of the soil was dried in an oven (104°C) to a constant weight in order to determine the dry weight and thereby the initial moisture content. A portion of the soil was sent to a soil analysis laboratory (Bedrijfslaboratorium voor Grond en Gewasonderzoek, Oosterbeek, the Netherlands) for characterization. In terms of texture, the loam was composed of 35% sand, 49% silt and 15% clay. The organic matter content was 1.4% and the pH was 7.6. The maximum field moisture capacity was 34%.</p>
Duration of test (contact time):	3 d
Initial conc.:	2 other: mg dry weight/L
Details on study design:	<p>Closed Bottle test:</p> <p>The biodegradability was determined as follows: Test substance was added to either seawater, water from the river IJssel, ditch water or mineral medium inoculated with activated sludge such that its concentration was 2 mg dry weight/l. The oxygen decrease in the bottles as a function of time was measured using a special funnel. This funnel fitted exactly into the bottle and served as an overflow reservoir permitting multiple measurements in one bottle. In some cases, this device was also used to measure the biological oxygen demand continuously by connecting the oxygen monitor to a recorder. Biochemical oxygen demands (BOD) of the test substances were corrected by subtracting the BOD of the control. The biodegradability was calculated by dividing the corrected BOD by the chemical oxygen demand (COD).</p>
Reference substance:	benzoic acid, sodium salt
Remarks:	Controls with benzoate revealed that there was no appreciable difference with respect to the lag phase with unadapted sludge and sludge acclimatized to cocobenzyl dimethylammonium chloride.
	Key result
Parameter:	% degradation (O2 consumption)
Value:	60
Sampling time:	3 d
Details on results:	<p>- The test substance biodegradation was &gt;60% within three days in the closed bottle test inoculated with this unacclimatized sludge. Hence it should be classified as readily biodegradable.</p> <p>Compared to test substance, tallow benzyl dimethylammonium chloride was less easily biodegradable in closed bottle tests. Differences were observed with respect to the length of the lag phase and the slope of the biodegradation curve. The differences are caused by the toxicity of tallow benzyl dimethylammonium chloride in the closed bottle test as shown by the inhibition of the endogenous respiration. The flat slope obtained with tallow benzyl dimethylammonium chloride in the closed bottle test suggests that this compound is degraded at low rates. However, the biodegradation rate of alkyl benzyl dimethylammonium salts with longer alkyl chains is probably governed by the rate of desorption from the sludge or glass wall of the bottles. From the literature, alkyl benzyl dimethylammonium chlorides with C10 to C14 alkyl chains were shown to be readily biodegradable (Masuda, 1976). The underlying causes for the failure to demonstrate the readily biodegradability of alkyl benzyl dimethylammonium salts with C16 to C18 alkyl chains are the toxicity of these compounds and their limited bioavailability.</p> <p>- In soil, a 64% biodegradation of the test substance was reached after 70 days, this percentage indicates complete mineralization in soil (the test substance biodegradation rate is limited by the desorption rate from the soil).</p> <p>- In the closed bottle test, the biodegradation of the test substance was 71, 69 and 60% in seawater, ditch water and river water, respectively (half lives of 0.3, 0.1 and 0.1 d respectively).</p> <p>The closed bottle test results with adapted and unadapted sludge demonstrate that exposure of sludge to test substance only results in higher levels of cocobenzyl dimethylammonium chloride-, N, N-dimethylbenzylamine- and dimethylamine-degrading microorganisms. Exposure to the test substance probably selected three microorganisms that utilize the alkyl chain, the aromatic moiety and the dimethylamine sequentially.</p> <p>- The results clearly illustrate that the test substance was completely converted into water, carbon dioxide, and ammonia. Additional proof of the complete oxidation is given by the high BOD/ThOD ratio obtained in the closed bottle test inoculated with both acclimatized and unacclimatized sludge.</p> <p>- On the basis of the low half-lives calculated, biodegradation of test substance was shown to be an environmentally significant process. It can be degraded in rivers, ditches, seawater, soil, and activated sludge plants. Accumulation of intermediate products is not expected.</p>
Interpretation of results:	readily biodegradable
Conclusions:	Under the study conditions, the biodegradation of the test substance was determined to be >60% within three days in the closed bottle test inoculated with unacclimatized sludge. The test substance was therefore considered readily biodegradable.
Executive summary:	<p>A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (49-52% active in water) in water according to OECD Guideline 301D (closed bottle test). Half-lives were determined using inoculum from various aquatic sources. The test substance was added to either seawater or water from the river IJssel, ditch water or mineral medium inoculated with activated sludge such that its concentration was 2 mg/dry weight/L. The oxygen decrease in the bottles as a function of time was measured using a special funnel. This funnel fitted exactly into the bottle and served as an overflow reservoir permitting multiple measurements in one bottle. Biochemical oxygen demands (BOD) of the test substances were corrected by subtracting the BOD of the control. The biodegradability was calculated by dividing the corrected BOD by the chemical oxygen demand (COD). The biodegradation of the test substance was 71, 69 and 60% in seawater, ditch water and river water, with half-lives of 0.3, 0.1 and 0.1 d, respectively. Under the study conditions, the biodegradation of the test substance was determined to be &gt;60% within three days in the closed bottle test inoculated with unacclimatized sludge. The test substance was therefore considered readily biodegradable (van Ginkel, 1996).</p>

<b>Reference 4</b>	
Endpoint:	biodegradation in water: screening tests
Type of information:	experimental study
Adequacy of study:	supporting study
Study period:	From October 11, 1992 to January 11, 1993
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	guideline study with acceptable restrictions
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Deviations:	yes
Remarks:	See 'Principles of method if other than guideline'
Qualifier:	according to guideline
Guideline:	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)
Deviations:	yes
Remarks:	See 'Principles of method if other than guideline'
Principles of method if other than guideline:	<p>- Deviations OECD 301 D: Ammonium chloride was omitted from the medium to prevent nitrification. The closed bottle test was prolonged by measuring the course of the oxygen decrease in the bottles of Day 28 using a special funnel. This funnel fitted exactly in the BOD bottle. Subsequently, the oxygen electrode was inserted in the BOD bottle to measure the oxygen concentration. The medium dissipated by the electrode was collected in the funnel. After withdrawal of the electrode the medium collected flowed back into the BOD bottle, followed by removal of the funnel and closing the BOD bottle. The test substance was toxic to microorganisms. Therefore, it was tested in the presence of silica gel to reduce the concentration in the water phase. During the test period, the test substance should be released slowly from the silica gel (0.5 g/bottle). Although no additional oxygen consumption was expected, controls with silica gel were carried out as well (10 bottles containing test substance, inoculum and silica gel).</p> <p>- Deviations OECD 302 A: Fill and draw procedure was only six times per week instead of daily. To maintain a constant pH in the SCAS unit, phosphate buffer was added six times per week. Effluent samples were filtered using cellulose nitrate filters with pores of 8 µm to remove sludge particles.</p>
GLP compliance:	yes
Oxygen conditions:	aerobic
Inoculum or test system:	other: The study was conducted, in parallel with a SCAS test, where sludge from the SCAS test unit on Day 0 (corresponding to non-adapted) and Day 21 (adapted) were fed into separate test vessels for the closed bottled test.
Duration of test (contact time):	>= 28 - <= 56 d
Initial conc.:	2 mg/L
Based on:	test mat.
	Key result
Parameter:	% degradation (O2 consumption)
Value:	52
Sampling time:	28 d
Remarks on result:	other: inoculated with sludge from the SCAS unit (Day 0); 62% biodegradation at Day 56
	Key result
Parameter:	% degradation (O2 consumption)
Value:	77
Sampling time:	28 d
Remarks on result:	other: inoculated with activated sludge from the SCAS unit (Day 21)
Remarks:	The biodegradation in the closed bottle tests did increase due to the acclimatisation of the microorganisms in the SCAS test unit.
Details on results:	<p>- OECD 302A: Before the addition of the test substance, the effluent non purgeable organic carbon (NPOC) values obtained from the test substance unit and the control unit were comparable and constant. After the first addition (Day 0), the removal of 69% was immediately accomplished due to the adsorption on the sludge, dilution and/or biodegradation. Next, the NPOC values of the units decreased and subsequently remained constant. The percentage removal after 4 weeks over 3 consecutive measurements was 99. Additional closed bottle tests were performed to draw conclusion on the removal mechanism in the SCAS test.</p> <p>- OECD 301D: In the closed bottle tests inoculated with sludge taken on Days 0, and 21 from the SCAS test unit, biodegradation of the test substance took place. The test substance was biodegraded at 52% on Day 28 in the closed bottle test inoculated with sludge from the SCAS test (Day 0). In the prolonged closed bottle test the test substance was biodegraded at 62% on Day 56. The biodegradation in the closed bottle tests did increase due to acclimatization of the microorganisms in the SCAS test unit. The test substance was biodegraded at 77% on Day 28 in the closed bottle test inoculated with sludge sampled on Day 21.</p>
<p>The test substance was degraded in waste water treatment plant after a short acclimatization period (5 d). In an acclimatized waste water treatment plant, the test substance was probably totally mineralized. Total mineralization was demonstrated by increased biodegradation percentages in the closed bottle test inoculated with sludge taken on Day 21 compared to the closed bottle test inoculated with unacclimatized sludge. The algal growth inhibition test showed that the</p>	

effluent of Day 1 was slightly toxic. This toxicity was probably caused by the test substance and/or biodegradation products present in the effluent of the test unit of the SCAS test. The results of the toxicity test of Day 23 demonstrated that acclimatized waste water treatment plants detoxified the test substance by biodegradation.

Validity criteria fulfilled:	yes
Interpretation of results:	inherently biodegradable
Conclusions:	Under the study conditions, the test substance was considered to be inherently biodegradable.
Executive summary:	A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (50% active in water) in water according to OECD Guidelines 301D and 302A (closed bottle test / modified SCAS test), in compliance with GLP. The experiment was carried out using a combination of an inherent and a ready biodegradability test. To predict the effects of possible biodegradation products, the toxicity of effluents from semi-continuous activated sludge (SCAS) units was assessed. The test substance caused no reduction of the biodegradation of non-purgeable organic carbon (NPOC) present in primary settled sewage. Therefore, it was considered to be non-inhibitory to activated sludge. During the test period, 99% of the substance was removed from the wastewater by adsorption and/or biodegradation. In a second step, the distinction between biodegradation and adsorption was evaluated in closed bottle tests inoculated with approximately 2 mg/L of activated sludge collected on Days 0 and 28 from the SCAS unit fed with the test substance. With the Day 0 SCAS sample, the test substance was biodegraded by 52% within 28 d and by 62% within 56 d. The biodegradation in the closed bottle tests did increase due to the acclimatisation of the microorganisms in the SCAS test unit. The test substance was biodegraded at 77% on Day 28 in the closed bottle test inoculated with sludge sampled on Day 28. The closed bottle test results demonstrated that the test substance was removed by biodegradation in the SCAS test. Under the study conditions, the test substance was considered to be inherently biodegradable (van Ginkel, 1993). This study was primarily carried out to determine the biodegradation pathway of alkylbenzyltrimethylammonium salts and not to assess the ready biodegradability; therefore, the study has been used only as a supporting study.

<b><u>Reference 5</u></b>	
Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Study period:	From December 12, 1986 to February 04, 1987
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	guideline study with acceptable restrictions
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Deviations:	yes
GLP compliance:	no
Remarks:	But includes statement of inspections by GLP quality assurance officer.
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, non-adapted
Details on inoculum:	The inoculum is taken from an activated sludge plant, the municipal waste water treatment plant in Duiven (NL). The sludge is preconditioned during a week: a sludge suspension of 1 g/L is aerated in the dilution water. This modification is introduced to reduce high residual respiration rates.
Duration of test (contact time):	42 d
Initial conc.:	2.5 mg/L
Based on:	test mat.
Parameter followed for biodegradation estimation:	O2 consumption
Details on study design:	Performance of the test: The biodegradability test was carried out according to OECD Test Guideline 301D: Closed Bottle Test. The method was modified according to the recommendations of ECETOC (1985) or Blok et al. (1985). Modifications concern the inoculum, the composition of the dilution water and the analyses. The density of the inoculum in the test was 3 mg/L. On Day 0, 14, 28 and 42 the concentration of oxygen was measured. On Day 28, nitrite and nitrate concentrations were measured. The dilution water was the medium as prescribed by the test guideline without ammonia. This modification was introduced to minimize the consumption of oxygen for the nitrification process. Dark glass bottles of about 280 mL with glass stoppers were filled completely with a suspension of preconditioned activated sludge (3 mg/L) in dilution water and a concentration of the test substance equivalent to about 6 mg ThOD/L (Theoretical Oxygen Demand). The test was carried out in triplicate and at every observation time measurements of oxygen and pH were carried out in a new series of three bottles.
Reference substance:	acetic acid, sodium salt
Test performance:	Adequate reference substance performance. Adequate blank performance.
	Key result
Parameter:	% degradation (O2 consumption)
Value:	65
Sampling time:	28 d
Details on results:	- A toxicity control was carried out with 4.3 and 12.8 mg of test substance and was found not to be toxic at these concentrations although a slight inhibition was seen at 12.8 mg/L. - Ready biodegradable
Validity criteria fulfilled:	no

Interpretation of results:	readily biodegradable
Conclusions:	Under the conditions of the study, the test substance was considered readily biodegradable.
Executive summary:	<p>A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (50.15% active in hydroglycolic solution) in water according to OECD Guideline 301D (closed bottle test). The method was adapted according to the recommendations of ECETOC (1985) or Blok et al. (1985). Modifications concerned the inoculum, the composition of the dilution water and the analyses. The inoculum was taken from an activated sludge plant, the municipal waste water treatment plant in Duiven (NL). The sludge was preconditioned by aeration, to reduce high residual respiration rates. The density of the inoculum in the test was 3 mg s.s./L. On Days 0, 14, 28 and 42, the concentration of oxygen was measured. On Day 28, nitrite and nitrate concentrations were measured. The dilution water was the medium as prescribed by the test guideline without ammonia. This modification was introduced to minimize the consumption of oxygen for the nitrification process. Dark glass bottles of about 280 mL with glass stoppers were filled completely with a suspension of pre-conditioned activated sludge (3 mg/L) in dilution water and a concentration of the test substance equivalent to about 6 mg ThOD/L (Theoretical Oxygen Demand). The test was carried out in triplicate and at every observation time measurements of oxygen and pH were conducted in a new series of three bottles. The test concentration was 4.3 mg/L, therefore the COD in the test suspension was 5.2 mg O<sub>2</sub>/L. After 4 weeks, the nitrite and nitrate concentrations were measured to be &lt;0.1 and &lt;1.5 mg/L respectively. The extent of biodegradation, calculated as the BOD related to the COD for test substance is about 65% after 2, 4 and 6 weeks. All validity criteria were fulfilled: i.e., inoculum blank indicated &gt;1.5 mg dissolved oxygen/L after 28 days; the residual concentration of oxygen in the test bottles were &gt;0.5 mg/L; difference of extremes of replicate values of the removal of the test chemical at the plateau, at the end of the test or at the end of the 10-d window, as appropriate, was less than 20%; and toxicity control showed &gt;25% degradation. Therefore, under the conditions of the study, the test substance was considered readily biodegradable (Balk, 1987).</p>

<b>Reference 6</b>	
Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Study period:	From November 06, 1991 to December 05, 1991
Reliability:	1 (reliable without restriction)
Rationale for reliability incl. deficiencies:	guideline study
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 B (Ready Biodegradability: CO <sub>2</sub> Evolution Test)
Deviations:	no
GLP compliance:	yes
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, adapted
Details on inoculum:	<ul style="list-style-type: none"> <li>- Source of inoculum/activated sludge (e.g. location, sampling depth, contamination history, procedure): acclimated activated sludge, Avondale Sewage Treatment Plant, Avondale.</li> <li>- Method of cultivation and preparation of the inoculum mixture: acclimated activated sludge was obtained from the final day of a previous SCAS assay conducted with the test substance at a concentration of 10 mg active substance per litre. Approximately 150 mL of mixed liquor was collected from each duplicate units, composited and homogenized at medium speed in a blender for 2 minutes. The homogenised sample was poured into a beaker and allowed to settle for 30 mins. The supernatant was decanted and added to the flasks at a conc. of 1% (v/v). On the same day the sludge was collected a standard plate count (SPC) was performed on the inoculum. The plates were incubated at test temperature. The result was 2.3 E06 CFU/mL</li> <li>- Inoculum addition: 20 mL of the above inoculum mixture was added to all test flasks.</li> </ul>
Duration of test (contact time):	28 d
Initial conc.:	5 mg/L
Based on:	act. ingr.
Initial conc.:	10 mg/L
Based on:	act. ingr.
Parameter followed for biodegradation estimation:	CO <sub>2</sub> evolution
Details on study design:	<p>Test conditions:</p> <ul style="list-style-type: none"> <li>- Composition of medium: Modified BOD water</li> <li>- Test temperature: 22.1- 23.0°C</li> </ul> <p>Test system:</p> <ul style="list-style-type: none"> <li>- Culturing apparatus: four glass four-litre Erlenmeyer flasks containing two litres of modified biochemical oxygen demand (BOD) water</li> <li>- Number of culture flasks/concentration: 1</li> <li>- Method used to create aerobic conditions: The test flasks were placed on a rotary shaker, connected to the scrubbing train and aerated over-night to purge the system of background CO<sub>2</sub>.</li> <li>- Details of trap for CO<sub>2</sub> and volatile organics if used: the CO<sub>2</sub> produced in each flask reacted with 0.024 N Ba(OH)<sub>2</sub> and precipitated as BaCO<sub>3</sub>. The amount of CO<sub>2</sub> produced was determined by titrating the remaining Ba(OH)<sub>2</sub> with 0.05 N standardized hydrochloric acid (HCl).</li> <li>- Other: after 28 d, the contents of the flasks were acidified with concentrated sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) and aerated overnight. One final titration was performed.</li> </ul> <p>Sampling:</p> <ul style="list-style-type: none"> <li>- Sampling frequency: on Day 2, 5, 8, 11, 14, 17, 20, 23, 28.</li> </ul> <p>Control and blank system:</p> <ul style="list-style-type: none"> <li>- Inoculum blank: one flask containing test medium and inoculum</li> <li>- Reference control: one flask containing only d-glucose at a conc. of 20 mg active/L</li> </ul>

Statistical methods: - Gauss-newton method			
Reference substance:	other: d-glucose at a concentration of 20 mg/L		
Key result			
Parameter:	% degradation (CO2 evolution)		
Value:	84		
Sampling time:	28 d		
Remarks on result:	other: at 5 mg/L concentration		
Key result			
Parameter:	% degradation (CO2 evolution)		
Value:	82.6		
Sampling time:	28 d		
Remarks on result:	other: at 10 mg/L concentration		
Details on results:	- Biodegradability in the test flasks was determined to be 84.0% and 82.6% within 28 d at 5 and 10 mg/L of test substance respectively. - Biodegradation in the blank was 0%. - Final SOC test concentrations were 0.7 mL/L (5 mg/L) and 0.6 mL/L (10 mg/L) compared to 0.4 mL/L with the control and 2.2 mL/L with d-glucose.		
Results with reference substance:	Biodegradability in the reference flask was determined to be 80.6% in 28 d.		
Table 1. % TCO2 over time			
Day	d-glucose	Test substance 5 mg a.i./L	Test substance 10 mg a.i./L
2	20.6	9.3	1.8
5	39.2	43.8	39.1
8	50.6	58.5	54.2
11	61.0	75.4	67.9
14	64.9	85.0	76.0
17	69.2	88.5	80.2
20	73.4	87.2	81.6
23	77.0	85.6	81.9
28	80.1	85.0	82.3
28	80.6	84.0	82.6
Table 2. Final results			
Test substance	Concentration (mg a.i./L)	Final %TCO2	Final SOC (mL/L)
Control (blank)	0	0	0.4
d-glucose	20	80.6	2.2
Test substance	5	84.0	0.7
Test substance	10	82.6	0.6
Validity criteria fulfilled:	not specified		
Interpretation of results:	readily biodegradable		
Conclusions:	Under the conditions of the study, the test substance was considered to be readily biodegradable.		
Executive summary:	A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (80.8% active in ethanol) in water according to OECD Guideline 301B (CO2 evolution test), in compliance with GLP. Flasks containing acclimated inoculum (at 10 mg/L) from a previous SCAS assay were dosed with 5 and 10 mg a.i./L of the test substance or 20 mg/L of the reference substance (d-glucose) and were maintained for 28 d. Biodegradability was calculated from the CO2 released over time in the test and reference flasks relative to that which was released in the blank control (a flask prepared without test or reference substance). The results indicated that 84.0 and 82.6% CO2 was produced in vessels dosed with 5 and 10 mg/L test substance, respectively, compared to 0% with the control and 80.6% with d-glucose. Final suspended organic carbon (SOC) concentrations were 0.7 mL/L (5 mg/L) and 0.6 mL/L (10 mg/L) compared to 0.4 mL/L with the control and 2.2 mL/L with d-glucose. Under the conditions of the study, the substance was considered to be readily biodegradable (Corby, 1992a).		

## Reference 7

Endpoint:	biodegradation in water: inherent biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Study period:	From October 30, 1991 to November 06, 1991

Reliability:	1 (reliable without restriction)	
Rationale for reliability incl. deficiencies:	guideline study	
Qualifier:	according to guideline	
Guideline:	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)	
Deviations:	no	
GLP compliance:	yes	
Oxygen conditions:	aerobic	
Inoculum or test system:	activated sludge, domestic, adapted	
Details on inoculum:	<ul style="list-style-type: none"><li>- Source of inoculum/activated sludge (e.g. location, sampling depth, contamination history, procedure): acclimated activated sludge, Avondale Sewage Treatment Plant, Avondale.</li><li>- Preparation of the SCAS units: the sludge was screened through a 2 mm sieve to remove large clumps. The total suspended solids (TSS) level was determined and based on this reading the sludge was distributed among the SCAS units such that when the volume in each unit was adjusted to 1.5L with tap water the suspended solids level was approx. 2500 mg/L.</li><li>- Pre-acclimation period: the units were aerated for 23 and half hours at a rate adequate to maintain solids suspension. At the end of this period, the air was turned off and the sludge was allowed to settle for 30 mins. One liter of effluent was drawn off and replaced with 1L of influent consisting of 10 mL synthetic sewage and 990 mL tap water to bring back to 1.5L. The air was turned on. This process was repeated on a daily basis.</li><li>- Sludge acclimation period: all the units were fed 10 mL of synthetic sewage and 990 mL of tap water daily for a minimum of 4d prior to initiation of the test substance acclimation period.</li><li>- Sludge distribution: on the day where the addition of the test substance was to be started, the sludge was settled, composited, and re-distributed among the units so that each unit contained a uniform sample of the sludge.</li></ul>	
Duration of test (contact time):	7 d	
Initial conc.:	10 mg/L	
Based on:	act. ingr.	
Parameter followed for biodegradation estimation:	other: SOC removal	
Details on study design:	<p>Test conditions:</p> <ul style="list-style-type: none"><li>- Composition of medium: synthetic sewage. It was prepared using the following composition: d-glucose: 30g; nutrient broth: 20g; K2HPO4: 13g; tap water: 1L. 20 mL of synthetic sewage was added to each unit on the 1st two days of the pre-acclimation period to help maintain suspended solids at 2500 mg/L.</li><li>- Temperature: 21.9-23.2°C</li><li>- Suspended solids concentration: 2500 mg/L.</li><li>- Lighting: during daily maintenance, the SCAS units were exposed to only room lighting and not exposed to direct sunlight.</li><li>- Other:</li></ul> <p>Test substance acclimation period: the test substance was added to the test units incrementally for a 7-d acclimation period. The control units are treated in the same way except that they do not receive any of the test substance.</p> <p>Testing period: the test substance was added to the test units at the specified test concentration for an additional 7d following the acclimation period. The control units were treated on the same way.</p> <p>Test system:</p> <ul style="list-style-type: none"><li>- Culturing apparatus: SCAS aeration chambers containing 1.5L of the activated sludge</li><li>- Number of culture flasks/concentration: 2</li></ul> <p>Sampling:</p> <ul style="list-style-type: none"><li>- Sampling frequency: daily (i.e., on Day 1, 2, 3, 4, 5, 6 and 7)</li><li>- Effluent analysis: one liter of effluent was withdrawn daily from each unit and saved for analysis. The effluent was replaces with comparable volume of influent of synthetic sewage. An aliquot of each effluent sample was centrifuged. A subsample of centrate was acidified with conc. H2SO4, purged with N2 and submitted for soluble organin chemical analysis (SOC).</li></ul> <p>Control and blank sampling system:</p> <ul style="list-style-type: none"><li>- Inoculum blank: yes, two control units were maintained only on synthetic sewage</li></ul> <p>Statistical method: Analysis of variance (ANOVA)</p>	
	Key result	
Parameter:	other: % SOC removal	
Value:	100	
Sampling time:	7 d	
Details on results:	<ul style="list-style-type: none"><li>- The percentage of carbon removed varied from 98.22% to 106.51% over a 7-d period between the two test vessels. The average percent SOC removal for test substance was &gt;100%.</li><li>- The mean SOC value in mg/L was 4.1±0.3 for control 1 and 4±0.3 for control 2.</li></ul>	
Table 1. % Carbon removed		
Days	Test 1	Test 2
1	100.59	102.96
2	98.22	106.51
3	100.00	104.73
4	98.22	100.59
5	100.59	102.96
6	101.18	104.73
7	102.96	102.96
Validity criteria fulfilled:	not specified	



Interpretation of results:	inherently biodegradable
Conclusions:	Under the conditions of the study, the average percent SOC removal of the test substance was >100% indicating it to be inherently biodegradable.
Executive summary:	A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (80.8% active in ethanol) in water according to OECD Guideline 302A (Modified SCAS test), in compliance with GLP. Four chambers containing activated sludge were aerated and the suspended solid contents were adjusted to 2500 mg/L. The test substance at 1000 mg a.i./L was added to two test units for a 7 d acclimation period. This consisted of incremental additions until the final test concentration of 10 mg a.i./L was reached. Two additional units did not receive test substance and served as controls. The testing period was an additional 7 d following the acclimation period. Throughout the study, all units were fed synthetic sewage. Effluents withdrawn from each unit were analysed for SOC. Under the conditions of the study, the average percent SOC removal was >100% indicating that the test substance was inherently biodegradable (Corby, 1992b).

## Reference 8

Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Remarks:	Literature data
Adequacy of study:	supporting study
Reliability:	4 (not assignable)
Rationale for reliability incl. deficiencies:	other: Documentation insufficient for assessment.
Principles of method if other than guideline:	High performance liquid chromatography and gas chromatography mass spectrometry analyses have been used to study the degradation pathway.
GLP compliance:	not specified
Inoculum or test system:	activated sludge (adaptation not specified)
<p>Aeromonas hydrophila sp. K, an organism isolated from soil is capable of utilising alkylbenzyltrimethylammonium salts as sole source of carbon and energy. High performance liquid chromatography and gas chromatography mass spectrometry analyses have been used to study the degradation pathway. During alkylbenzyltrimethylammonium chloride biodegradation, formation of benzyltrimethylamine, benzylmethylamine, benzylamine, benzaldehyde and benzoic acid occurs. Formation of benzyltrimethylamine suggests that the cleavage of Calkyl-N bond occurs as the first step of alkylbenzyltrimethylammonium chloride metabolism [Patrauchan and Oriel, 2003]. A series of Closed Bottle tests inoculated with unadapted micro-organisms and micro-organisms adapted to decylbenzyltrimethylammonium chloride also suggests cleavage of the Calkyl-N bond [van Ginkel, 2004]. The alkyl chains of the quaternary ammonium salts are liberated as alkanals [van Ginkel, 2004]. Alkanals are subsequently channelled into the -oxidation cycle. Dimethylbenzylamine is degraded by other micro-organisms [Patrauchan and Oriel, 2003]. This biodegradation pathway i.e. channelling all alkyl chains with varying length into -oxidation cycle allows intrapolation and extrapolation of ready biodegradability test results. For a number of alkylbenzyltrimethylammonium salts biodegradation percentages of &gt;60 have been obtained after 28 d in ready biodegradability test. Alkylbenzyltrimethylammonium salts with alkyl chains ranging from C8 to C18 are therefore readily biodegradable. Read across of biodegradation data is not restricted to ready biodegradation tests.</p>	
Interpretation of results:	readily biodegradable
Conclusions:	Based on the literature data, the test substance is considered readily biodegradable.
Executive summary:	A literature review was conducted to determine the biodegradability of the test substance, C12 -16 ADBAC (purity not specified). Van Ginkel et al 2004 and Patrauchan et al 2003 publication were reviewed. Based on the literature data, the test substance is considered readily biodegradable (Van Ginkel, 2004 and Patrauchan, 2003).

## Description of key information

A number of reliable studies have shown that the test substance is readily biodegradable.

## Key value for chemical safety assessment

Biodegradation in water:	readily biodegradable
Type of water:	freshwater

## Additional information

Freshwater:

**Study 1:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (50.1% active in water) in water according to OECD Guideline 301D (closed bottle test), in compliance with GLP. Secondary activated sludge was used in this experiment and the percentage of degradation (O2 consumption) was measured. Since the substance was toxic to microorganisms, it was tested in the presence of silica gel to reduce the concentration in the water phase. During the test period, the substance was released slowly from the silica gel. The validity of the test was demonstrated by an endogenous respiration of 1.3 mg/L at Day 28. Furthermore, the differences between the replicate values at Day 28 were less than 20%. The biodegradation of the reference substance, sodium acetate, at Day 14 was 78%. Finally, the validity of the test was shown by oxygen concentrations being > 0.5 mg/L in the bottles. Under the conditions of the study, the biodegradation of the substance was determined to be 63% at Day 28. The substance was considered readily biodegradable (van Ginkel and Stroo, 1992).

**Study 2:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (80% active in hydroalcoholic solution), in water according to OECD Guideline 301B (CO2 evolution test). Flasks containing inoculum from a household water-treating plant dosed with the equivalent of 5 mg C/L test or 20 mg C/L reference substances were maintained for 28 d. Testing at low concentrations, was required due to the toxicity of the test substance towards the inoculum at higher concentrations. Biodegradability was calculated from the released CO2 over time in the test and reference flasks compared to the blank control (a flask prepared without test or reference substance). CO2 production in the blank (inoculum control) was 39.2 mg. Biodegradability in the reference flask was determined to be 88.9% after 28 d. Under the test conditions, the

biodegradation of the test substance in water was determined to be 95.5% after 28 d (CO<sub>2</sub> evolution). The test substance was considered to be readily biodegradable (van Dievoet, 2005). This study was also submitted as part of the biocides dossier for product type-8 and was concluded by the authority to be a key and valid study (see below discussions; ECHA assessment report, 2015).

**Study 3:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (49-52% active in water) in water according to OECD Guideline 301D (closed bottle test). Half-lives were determined using inoculum from various aquatic sources. The test substance was added to either seawater or water from the river IJssel, ditch water or mineral medium inoculated with activated sludge such that its concentration was 2 mg/dry weight/L. The oxygen decrease in the bottles as a function of time was measured using a special funnel. This funnel fitted exactly into the bottle and derived as an overflow reservoir permitting multiple measurements in one bottle. Biochemical oxygen demands (BOD) of the test substances were corrected by subtracting the BOD of the control. The biodegradability was calculated by dividing the corrected BOD by the chemical oxygen demand (COD). The biodegradation of the test substance was 71, 69 and 60% in seawater, ditch water and river water, with half-lives of 0.3, 0.1 and 0.1 d, respectively. Under the study conditions, the biodegradation of the test substance was determined to be >60% within three days in the closed bottle test inoculated with unacclimatized sludge. The test substance was therefore considered readily biodegradable (van Ginkel, 1996).

**Study 4:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (50.15% active in hydroglycolic solution) in water according to OECD Guideline 301D (closed bottle test). The method was adapted according to the recommendations of ECETOC (1985) or Blok et al. (1985). Modifications concerned the inoculum, the composition of the dilution water and the analyses. The inoculum was taken from an activated sludge plant, the municipal wastewater treatment plant in Duiven (NL). The sludge was preconditioned by aeration, to reduce high residual respiration rates. The density of the inoculum in the test was 3 mg s.s./L. On Days 0, 14, 28 and 42, the concentration of oxygen was measured. On Day 28, nitrite and nitrate concentrations were measured. The dilution water was the medium as prescribed by the test guideline without ammonia. This modification was introduced to minimize the consumption of oxygen for the nitrification process. Dark glass bottles of about 280 mL with glass stoppers were filled with a suspension of pre-conditioned activated sludge (3 mg/L) in dilution water and a concentration of the test substance equivalent to about 6 mg ThOD/L (Theoretical Oxygen Demand). The test was carried out in triplicate and at every observation time measurements of oxygen and pH were conducted in a new series of three bottles. The test concentration was 4.3 mg/L, therefore the COD in the test suspension was 5.2 mg O<sub>2</sub>/L. After 4 weeks, the nitrite and nitrate concentrations were measured to be <0.1 and <1.5 mg/L respectively. The extent of biodegradation, calculated as the BOD related to the COD for test substance is about 65% after 2, 4 and 6 weeks. All validity criteria were fulfilled: i.e., inoculum blank indicated >1.5 mg dissolved oxygen/L after 28 days; the residual concentration of oxygen in the test bottles were >0.5 mg/L; difference of extremes of replicate values of the removal of the test chemical at the plateau, at the end of the test or the end of the 10-d window, as appropriate, was less than 20%; and toxicity control showed >25% degradation. Therefore, under the conditions of the study, the test substance was considered readily biodegradable (Balk, 1987).

**Study 5:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (50% active in water) in water according to OECD Guidelines 301D and 302A (closed bottle test / modified SCAS test), in compliance with GLP. The experiment was carried out using a combination of an inherent and a ready biodegradability test. To predict the effects of possible biodegradation products, the toxicity of effluents from semi-continuous activated sludge (SCAS) units was assessed. The test substance caused no reduction of the biodegradation of non-purgeable organic carbon (NPOC) present in primary settled sewage. Therefore, it was considered to be non-inhibitory to activated sludge. During the test period, 99% of the substance was removed from the wastewater by adsorption and/or biodegradation. In a second step, the distinction between biodegradation and adsorption was evaluated in closed bottle tests inoculated with approximately 2 mg/L of activated sludge collected on Days 0 and 28 from the SCAS unit fed with the test substance. With the Day 0 SCAS sample, the test substance was biodegraded by 52% within 28 d and by 62% within 56 d. The biodegradation in the closed bottle tests did increase due to the acclimatisation of the microorganisms in the SCAS test unit. The test substance was biodegraded at 77% on Day 28 in the closed bottle test inoculated with sludge sampled on Day 28. The closed bottle test results demonstrated that the test substance was removed by biodegradation in the SCAS test. Under the study conditions, the test substance was considered to be inherently biodegradable (van Ginkel, 1993). This study was primarily carried out to determine the biodegradation pathway of alkylbenzyltrimethylammonium salts and not to assess the ready biodegradability; therefore, the study has been used only as a supporting study.

**Study 6:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (80.8% active in ethanol) in water according to OECD Guideline 301B (CO<sub>2</sub> evolution test), in compliance with GLP. Flasks containing acclimated inoculum (at 10 mg/L) from a previous SCAS assay were dosed with 5 and 10 mg a.i./L of the test substance or 20 mg/L of the reference substance (d-glucose) and were maintained for 28 d. Biodegradability was calculated from the CO<sub>2</sub> released over time in the test and reference flasks relative to that which was released in the blank control (a flask prepared without test or reference substance). The results indicated that 84.0 and 82.6% CO<sub>2</sub> was produced in vessels dosed with 5 and 10 mg/L test substance, respectively, compared to 0% with the control and 80.6% with d-glucose. Final suspended organic carbon (SOC) concentrations were 0.7 mg/L (5 mg/L) and 0.6 mg/L (10 mg/L) compared to 0.4 mg/L with the control and 2.2 mg/L with d-glucose. Under the conditions of the study, the substance was considered to be readily biodegradable (Corby, 1992a).

**Study 7:** A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (80.8% active in ethanol) in water according to OECD Guideline 302A (Modified SCAS test), in compliance with GLP. Four chambers containing activated sludge were aerated and the suspended solid contents were adjusted to 2500 mg/L. The test substance at 1000 mg a.i./L was added to two test units for a 7-d acclimation period. This consisted of incremental additions until the final test concentration of 10 mg a.i./L was reached. Two additional units did not receive the test substance and served as control. The testing period was an additional 7 d following the acclimation period. Throughout the study, all units were fed synthetic sewage. Effluents withdrawn from each unit were analysed for SOC. Under the conditions of the study, the average percent SOC removal was >100% indicating that the test substance was inherently biodegradable (Corby, 1992b).

A literature review was conducted to determine the biodegradability of the test substance, C12-16 ADBAC (purity not specified). Van Ginkel et al 2004 and Patrauchan et al 2003 publication were reviewed. Based on the literature data, the test substance is considered readily biodegradable (Van Ginkel, 2004 and Patrauchan, 2003).

The Biocides assessment report on C12-16 ADBAC, published by the Italian authorities in June 2015, reported the above key studies and stated that "The reliability factor of US ISC study (van Dievoet, 2005) is 1. Therefore, the study by US ISC should be considered for the environmental risk assessment at product authorization stage. In conclusion, ADBAC/BKC is ready biodegradable being the 10-day window criterion met (OECD 301B). On the other hand, the EQC study (van Ginkel and Stroo, 1992) has a reliability factor of 2 because it cannot distinguish between the degradation of ADBAC/BKC and Propan-2-ol (solvent). If we follow the argument that Propan-2-ol is readily biodegradable and might contribute more to the oxygen consumption. This results in an overestimation of ADBAC/BKC, and the 14-day window criteria was not met (OECD 301D). Alkyl (C12-16) dimethylbenzyl ammonium chloride is readily biodegradable."

Sea water:

A study was conducted to determine the biodegradation of the test substance, C12-16 ADBAC (49-52% active in water) in seawater and sediment according to OECD Guideline 306 (biodegradation in seawater). Three bottles containing only seawater and 3 bottles containing seawater and the test substance were used. The test substance was added at a concentration of 2 mg/L. The biodegradability was determined by following the course of the oxygen decrease in the bottles using a special funnel. The funnel fitted exactly in the bottle and served as an overflow reservoir permitting multiple measurements in one bottle. The oxygen concentration was measured on Days 0, 7, 14, 21, 28, 42, 56 and 84. The test substance was toxic to microorganisms and was therefore studied in the presence of silica gel to reduce the concentration in the water phase. During the test period, the substance should be released slowly from the silica gel (0.5 g/bottle). Although no additional oxygen consumption was expected, controls with silica gel were carried out as well. Under the study conditions, the test substance was biodegraded by 38 and 31% on Day 28 in the absence and the presence of silica gel, respectively. Since the test substance was biodegraded at 61% on Day 84 in the prolonged closed bottle test with silica gel, it is expected to be biodegraded in seawater (van Ginkel, 1994).

Therefore, based on the available information and in line with the biocides assessment report, the test substance is considered to be readily biodegradable.

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REACH

# Didecyldimethylammonium chloride

EC number: 230-525-2 | CAS number: 7173-51-5



Environmental fate & pathways

## Biodegradation in water: screening tests

S-01 | Summary

### Administrative data

### Link to relevant study record(s)

### Reference

Reference 1	
Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	key study
Study period:	November 18, 2004 - January 18, 2006
Reliability:	1 (reliable without restriction)
Rationale for reliability incl. deficiencies:	guideline study
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
Deviations:	no
GLP compliance:	yes (incl. QA statement)
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, domestic, non-adapted
Details on inoculum:	<div>- Source of inoculum/activated sludge (e.g. location, sampling depth, contamination history, procedure):Municipal Sewage treatment plant, D-31137, Hildesheim</div> <div>- Pretreatment:The activated sludge was washed twice with autoclaved tap water and maintained in an aerobic condition by aeration for 4 hours and then homogenized with a mixer for 2 min. Thereafter the sludge was filtered with folded filter and aerated with CO2-free air for 3 days.50 mL/L were used to initiate the inoculum.</div> <div>- Concentration of sludge:Not available</div> <div>- Initial cell/biomass concentration:10E+7-10E+8 CFU/mL</div> <div>- Water filtered: yes</div> <div>- Type and size of filter used, if any:Folded filter</div>
Duration of test (contact time):	ca. 28 d
Initial conc.:	10 mg/L
Based on:	act. ingr.
Initial conc.:	66.2 other: %
Based on:	<div>other: TOC</div> <div>CO2 evolution</div>

Parameter followed for biodegradation estimation:	
Details on study design:	<p>TEST CONDITIONS</p> <ul style="list-style-type: none"> <li>- Composition of medium:Mineral nutrient solution according to OECD 301B guideline</li> <li>- Test temperature:22±2°C</li> <li>- Aeration of dilution water:30-100 mL/min</li> <li>- Continuous darkness: Low light due to brown glass vessels</li> </ul> <p>TEST SYSTEM</p> <ul style="list-style-type: none"> <li>- Culturing apparatus:5000 mL brown glass vessels</li> <li>- Number of culture flasks/concentration:Two</li> <li>- Method used to create aerobic conditions:External aeration source at 30-100 mL/min</li> <li>- Details of trap for CO<sub>2</sub> and volatile organics if used:The air outlets of the incubation vessels with the test substance were connected to the CO<sub>2</sub> adsorption vessels via a series of 3 gas wash bottles, each containing 100 mL of a 0.0125 mol/L Ba(OH)<sub>2</sub> solution. Back titration of the residual Ba(OH)<sub>2</sub> was carried out with 0.5 N HCl.</li> </ul> <p>SAMPLING</p> <ul style="list-style-type: none"> <li>- Sampling frequency:Days 1, 3, 7, 10, 13, 15, 17, 21, 24, 28 and 29.</li> </ul> <p>CONTROL AND BLANK SYSTEM</p> <ul style="list-style-type: none"> <li>- Inoculum blank:Duplicate nutrient solutions</li> <li>- Toxicity control:Single vessel with the test substance and the reference substance in test concentration</li> </ul>
Reference substance:	acetic acid, sodium salt
Remarks:	at 35 mg/L
Preliminary study:	Not applicable
Test performance:	The test was performed without any deviations from the guideline and the study plan.
	Key result
Parameter:	% degradation (CO <sub>2</sub> evolution)
Value:	ca. 71
Sampling time:	28 d
Remarks on result:	other: for replicate 1
	Key result
Parameter:	% degradation (CO <sub>2</sub> evolution)
Value:	ca. 67
Sampling time:	28 d
Remarks on result:	other: for replicate 2
Details on results:	The 10% level (beginning of biodegradation) was achieved after 5 days in both the replicates of the test vessel. One replicate reached the pass level of 60% after 15 days, the other replicate reached the pass level after 16 days. The % biodegradation was 72 and 67% for replicate 1 and 2 respectively.
Results with reference substance:	The adaptation phase of the functional control changed after 1 day into the degradation phase (i.e., degradation ≥10%). The course of the degradation phase was rapid and reached a degradation rate of >60% on Day 8. The validity criterion for degradation ≥60% after 14 days is fulfilled.
In the control, a maximum of 46.5 mg CO <sub>2</sub> /L was formed after 28 days (validity criterion is <70 mg CO <sub>2</sub> /L after 28 days). In the toxicity control, 57% biodegradation occurred within 13 days and came to a maximum of 76% after 28 days. The biodegradation of the reference was not inhibited by the test substance.	
Validity criteria fulfilled:	yes
Interpretation of results:	readily biodegradable
Conclusions:	The test substance must be regarded as readily biodegradable in the 10-day window and after 28 days.
Executive summary:	<p>A study was carried out to determine the biodegradability of the test substance according to OECD guideline 301B, modified Sturm test.</p> <p>The test substance was tested at 10 mg/L in duplicate vessels, corresponding to a TOC of 6.62 mg/L in the test vessels. The biodegradation of the test substance was followed by titrimetric analysis of the quantity of the CO<sub>2</sub> produced by the respiration of the bacteria. The %CO<sub>2</sub> production was calculated in relation to the theoretical CO<sub>2</sub> of the test substance. The biodegradation was calculated</p>

for each titration time. Sodium acetate was used as the functional control to check the activity of the test system. The 10% level (beginning of biodegradation) was achieved after 5 days in both the replicates of the test vessel. One replicate reached the pass level of 60% after 15 days, the other replicate reached the pass level after 16 days. The % biodegradation was 72 and 67% for replicate 1 and 2 respectively. The course of the degradation phase of the functional control was rapid and reached a degradation rate of >60% on Day 8. The validity criterion for degradation  $\geq 60\%$  after 14 days is fulfilled. In the control, a maximum of 46.5 mg CO<sub>2</sub>/L was formed after 28 days (validity criterion is <70 mg CO<sub>2</sub>/L after 28 days). In the toxicity control, 57% biodegradation occurred within 13 days and came to a maximum of 76% after 28 days. The biodegradation of the reference was not inhibited by the test substance. The validity criteria of the guideline is fulfilled. The test substance must be regarded as readily biodegradable in the 10-day window and after 28 days.

## Reference 2

Endpoint:	biodegradation in water: ready biodegradability
Type of information:	experimental study
Adequacy of study:	key study
Study period:	From Dec 13, 1995 to Jan 18, 1996
Reliability:	1 (reliable without restriction)
Rationale for reliability incl. deficiencies:	guideline study
Qualifier:	according to guideline
Guideline:	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
GLP compliance:	yes (incl. QA statement)
Oxygen conditions:	aerobic
Inoculum or test system:	natural water
Details on inoculum:	Nature: River water Source: River IJssel, The Netherlands Sampling site: Region of Arnhem, The Netherlands Laboratory culture: No Preparation of inoculum for exposure: The river water was preconditioned to reduce the endogenous respiration rates. To this end, 8 L of river water was aerated for eight days. Pretreatment: No pre-treatment
Duration of test (contact time):	ca. 28 d
Initial conc.:	4 mg/L
Parameter followed for biodegradation estimation:	other: BOD (biochemical oxygen demand)
Parameter followed for biodegradation estimation:	O <sub>2</sub> consumption
Details on study design:	Culturing apparatus: 250 to 300 mL BOD (biological oxygen demand) bottles with glass stoppers. Number of culture flasks/concentration: 10 Measuring equipment: Oxygen electrode, pH-meter Test performed in closed vessels due to significant volatility of TS: No Additional substrate: No Test temperature: 20 – 22 °C pH: 8.5 at start, 7.8 at end of test Aeration of dilution water: No
Reference substance:	acetic acid, sodium salt
	Key result
Parameter:	% degradation (O <sub>2</sub> consumption)
Value:	ca. 69
Sampling time:	28 d
Details on results:	The test substance caused no reduction in the endogenous respiration, and is therefore considered to be non-inhibitory to the inoculum. The calculated chemical oxygen demand of the test substance was found to be 1.8 mg/mg. Didecyltrimethylammonium chloride was biodegraded 69% at day 28. Hence this compound should be classified as readily biodegradable.  Kinetic of test substance (in %): = 0 after 0 day(s) = 36 after 7 day(s) = 51 after 14 day(s) = 65 after 21 day(s)



	= 69 after 28 day(s)  Kinetic of control substance (in %): = 77 after 7 day(s) = 85 after 14 day(s)
Results with reference substance:	Controls with reference substance were carried out: 10 bottles containing sodium acetate (6.7 mg/L) and inoculum. Inhibition of the degradation of a well degradable compound, e.g. sodium acetate by the test compound in the Closed Bottle Test was not determined because possible toxicity of DDAC to microorganisms degrading acetate is not relevant. Inhibition of the endogenous respiration of the inoculum by the test substance was not detected. Therefore, no inhibition of the biodegradation due to the "high" initial concentration of the test compound is expected.
None	
Validity criteria fulfilled:	yes
Interpretation of results:	readily biodegradable
Conclusions:	DDAC should be classified as readily biodegradable.
Executive summary:	The ready biodegradability of the test substance was determined in a Closed Bottle test according to the slightly modified OECD, EEC and ISO test guidelines under GLP conditions. The test substance caused no reduction in the endogenous respiration in the closed bottles. Hence, it should be regarded as non-inhibitory to the inoculum. The test substance was biodegraded 69% at Day 28, and hence it should be classified as readily biodegradable. The test was considered as valid as shown by the endogenous respiration at 2.5 mg/L and by the total mineralisation of the reference substance, sodium acetate. The reference substance was degraded 85% after 14 days. Lastly, the oxygen concentrations in all the bottles were >0.5 mg/L during the test period.

<b><u>Reference 3</u></b>	
Endpoint:	biodegradation in water: inherent biodegradability
Type of information:	experimental study
Adequacy of study:	supporting study
Study period:	Jul 1989
Reliability:	2 (reliable with restrictions)
Rationale for reliability incl. deficiencies:	guideline study without detailed documentation
Qualifier:	according to guideline
Guideline:	EU Method C.9 (Biodegradation: Zahn-Wellens Test)
Deviations:	not specified
Qualifier:	according to guideline
Guideline:	other: DIN 38 412 Part 25
Deviations:	not specified
GLP compliance:	no
Oxygen conditions:	aerobic
Inoculum or test system:	activated sludge, non-adapted
Details on inoculum:	Activated sludge from the waste water treatment plant of ARA Kelsterbach/ARA Hoechst 70:30
Duration of test (contact time):	ca. 28 d
Initial conc.:	162 mg/L
Based on:	DOC
Initial conc.:	712 mg/L
Based on:	other: O <sub>2</sub> (CSB)
	Key result
Parameter:	% degradation (DOC removal)
Value:	ca. 80
Sampling time:	28 d
Remarks on result:	other: > 15 d adaptation time, afterwards rapid degradation. At the beginning, only adsorption to the sludge.
Details on results:	> 15 d adaptation time, afterwards rapid degradation. At the beginning, only adsorption to the sludge.
Interpretation of results:	inherently biodegradable
Conclusions:	Under the test conditions, the test substance was inherently biodegradable.
Executive summary:	A study was conducted to determine the inherent biodegradability of DDAC in a Zahn Wellens test. The substance required over 15 days of adaptation time, after which degradation was rapid (80% after 28 days). At test start, only adsorption to sludge occurred.

## Description of key information

Based on the study results, the test substance is considered to be readily biodegradable.

## Key value for chemical safety assessment

Biodegradation in water: readily biodegradable

Type of water: freshwater

## Additional information

The ready biodegradability of the test substance was determined according to OECD Guideline 301 D (Closed Bottle test) and 301 B (Sturm test) in compliance with GLP. In both studies, the substance was found to be readily biodegradable (Van Ginkel and Pomper, 1996 and Fiebig, 2000). Another study was conducted to determine inherent biodegradability in a Zahn Wellens test (EU Method C.9). The substance required over 15 days of adaptation time, after which degradation was rapid (80% after 28 days). At test start, only adsorption to sludge occurred (Voelkskow, 1989).

### Biodegradation mechanism

The pathway of dialkyldimethylammonium salts has been studied with pure cultures. The pure culture, strain DD1, capable of growing on didecyldimethylammonium salt as sole carbon and energy source was isolated from activated sludge. Decyldimethylamine, decanoate, and acetate also served as growth substrates. Dimethylamine was stoichiometrically accumulated during growth on didecyldimethylammonium chloride. These results strongly indicate that the alkyl chains are metabolized sequentially (van Ginkel et al, 2003). Another bacterium is required to degrade the dimethylamine formed (Large, 1971). Nishihara et al (2000) isolated a *Pseudomonas fluorescens* strain TN4 with didecyldimethylammonium chloride as carbon and energy source. Decyldimethylamine and dimethylamine were identified as intermediates in the biodegradation pathway. Both pure culture studies demonstrate that the degradation of the alkyl chains of dialkyldimethylammonium salts precedes the breakdown of the dimethylamine (Figure). *Pseudomonas fluorescens* strain TN4 also degraded other quaternary ammonium salts i.e., alkyltrimethylammonium salts and alkylbenzyltrimethylammonium compounds (Nishihara et al, 2000). Strain DD1 was also capable of growing on didodecyldimethylammonium and tetradecyldimethylammonium salts showing broad substrate specificity towards the alkyl chain lengths (van Ginkel et al, 2003). Broad substrate specificities with respect to alkyl chain were demonstrated more comprehensively for other fatty amine derivatives (van Ginkel, 2007[SM1]).

The Figure 1 in the CSR shows the ability of microorganisms to catalyze C-alkyl-N fissions, thereby forming alkanals that can enter the common pathways of metabolism via  $\beta$ -oxidation (van Ginkel, 2004).

Overall, based on the available information, DDAC is considered to be completely mineralised and therefore does not persist or present a risk to the environment.

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## Glutaral

REACH

EC number: 203-856-5 | CAS number: 111-30-8



Environmental fate & pathways

### Biodegradation in water: screening tests

S-01 | Summary

#### Administrative data

#### Link to relevant study record(s)

#### Description of key information

Glutaraldehyde is readily biodegradable and it has a potential to biodegrade in the marine environment.

#### Key value for chemical safety assessment

Biodegradation in water: readily biodegradable

#### Additional information

The ready biodegradability of glutaraldehyde 50% was tested in the DOC Die Away-Test (ISO 7827) according to OECD 301A (new version). The biodegradation of 20 mg/l DOC of the test substance was monitored for 28 days. 90-100% of the initial glutaraldehyde (20 mg/L DOC) was eliminated from water after 28 days (BASFAG 93/0406/21/1). Glutaraldehyde fulfilled the pass criteria in this test for ready biodegradability, which include the concept of the 10-days window. In conclusion, as neither toxicity nor abiotic degradation was observed in the controls at the concentration tested and further, the reference substance fulfilled the validity criteria, glutaraldehyde can be regarded as readily biodegradable in the test system used.

The biodegradability of glutaraldehyde 50% in marine water was investigated according to the marine CO<sub>2</sub>-Evolution Test (ISO 16221 comparable to OECD Guideline 306); the inoculum was seawater from the North Sea (BASFAG 01/0411/32/1). The biodegradation of glutaraldehyde was evaluated at an initial concentration of 32 mg/L. A previous test carried out with 100 mg/L, has shown clear toxic effects in the inhibition assay. The CO<sub>2</sub> evolution was considered as parameter indicative of marine biodegradation; the degree of marine biodegradation was expressed as CO<sub>2</sub> of the theoretical CO<sub>2</sub> (ThCO<sub>2</sub>). At an initial test concentration of 32 mg test substance/L equivalent to 10 mg/L TOC, the degree of biodegradation ranged from 90 to 100% at the end of incubation period (70 days). There were no indications for abiotic elimination processes; therefore, glutaraldehyde can be regarded as ultimate biodegradable under marine water conditions.

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REACH

## Propan-2-ol

EC number: 200-661-7 | CAS number: 67-63-0



Environmental fate & pathways

### Biodegradation in water: screening tests

S-01 | Summary

#### Administrative data

#### Link to relevant study record(s)

#### Description of key information

The substance has a BOD5/ThOD ratio of 0.50, and is therefore considered to be readily degradable.

#### Key value for chemical safety assessment

Biodegradation in water: readily biodegradable

#### Additional information

The BOD5 (non-adapted), BOD5 (adapted) and COD of the substance were reported by Bridié et al. (1979) to be 1.19 g O2/g, 1.72 g O2/g and 2.23 g O2/g, respectively. The BOD test was conducted in accordance with the standard dilution method (APHA "Standard Methods" No. 219 (1971)) at 20 ± 1°C for a period of 5 days. The only deviation from the APHA standard was the addition of 0.5 mg/l allylthiourea in each test to prevent nitrification. 500 ml test solutions were seeded with a filtered 10 ml volume of the effluent from a biological sanitary waste treatment plant. The authors reported that in some cases an adapted seed was prepared and used, although in no case was inducement of adaptation tried exhaustively. Duplicate tests were run on a mixture of glucose and glutamic acid, as recommended in the APHA method, as a means of checking the activity of the inoculum. The COD test was conducted in accordance with the standard potassium dichromate method described in ASTM D 1252-97 (reapproved 1974). The BOD5/COD ratios from these results are 0.53 (non-adapted) and 0.77 (adapted). As indicated in the REACH Endpoint Specific Guidance section R.7.9.5.1; where no other measured degradability data are available, BOD5 data can be used for classification purposes, but where the chemical structure is known, a calculated theoretical oxygen demand (ThOD) value should be used instead of the COD. According to Annex IV of OECD 301, the ThOD of this substance can be calculated to be 2.40 g O2/g, which gives BOD5/ThOD ratios of 0.50 (non-adapted) and 0.72 (adapted). The value for non-adapted seed equals 0.5, at which level or above a substance can be considered to be readily biodegradable.

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