European Commission

Enterprise Directorate-General

EU Legislative follow-up on: "Use of phosphates in detergents"

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Introduction to Phosphates in detergents

- Phosphates, mainly in the form of sodium tri-polyphosphate (STPP), are commonly used as builders in detergents, enhancing their cleaning efficiency.

- Although, no adverse health effects have been reported for STPP **(HERA, 2003: very low toxicity,no mutagenicity or genotoxicity),** there is a **prime environmental concern that:**
  "by increasing the phosphorus load on the environment, P-based detergents could contribute to the problem of eutrophication"

- Since mid-1980s a move towards phosphate-free detergents led to an increased use of zeolites (main alternative builders)

Country	Population (millions)%	% Phosphate-free
Belgium	10.4	100
Czeck Rebuplic	10.2	35
Denmark	5.4	80%
Germany	82.5	100%
Estonia	1.3	20%
Greece	11.0	50%
France	59.9	50%
Ireland	4.0	100%
Italy	57.8	100%
Cyprus	0.7	20%
Latvia	2.3	20%
Lithuania	3.4	20%
Luxemburg	0.4	100%
Hungary	10.1	30%
Netherlands	16.2	100%
Austria	8.1	100%
Poland	38.2	15%
Portugal	10.4	30%
Slovenia	2.0	95%
Spain	42.2	40%
Slovakia	5.4	20%
Finland	5.2	90%
Sweden	9.0	85%
United Kingdom	59.5	55%

Degree to which EU-25 is P-free
(Laundry Detergents)
(RPA, 2006)

EU-25
P-free: 66%

Current Legislative status in EU

- No harmonized EU legislation about the use of phosphates in detergents. MS are allowed to maintain or introduce national measures.
- A few MS have either imposed legislative measures (e.g. Italy, Czech Republic) or introduced volunteer agreements (e.g. Ireland, The Netherlands) with formulators to reduce or ban phosphates in detergents

Action at EU level

►**Detergents Regulation (648/2004 (EC)): Article 16(1)**

"By 8 April 2007, the Commission shall evaluate, submit a report and, where justified, present a legislative proposal on the use of phosphates with a view to their gradual phase-out or restriction to specific applications"

► **Actions relevant to aquatic P-levels are also indicated by:**
(I) The Urban Wastewater Treatment Directive (91/271/EEC)
(II) The Water Framework Directive (2000/60/EEC)
(III) The Nitrates Directive (91/676/EEC)

Latest Commission studies on P-use in detergents

An opinion of SCTEE (2003), over an earlier WRc report, recommended that:

- *"A quantitative assessment of the extent of eutrophication in EU waters in relation to phosphorus load from different sources, and in particular in relation to STPP, should be performed on the basis of existing experimental and modelling information".*

Following interactive discussion between the Commission and the associated Industry, CEEP (European Detergent Phosphate Industry) volunteered to carry out a relevant study

"European Quantitative Eutrophication RA of Polyphosphates in Detergents"
in collaboration with Green Planet Environmental Consulting SL and INIA-(Spanish National Institute for Agriculture and Food Research and Technology).

The main targets of the study were to:

- ► develop and apply on a regional basis within the EU, a probabilistic RA model for eutrophication,
- ►associate detergents polyphosphate emissions to eutrophication, in additional to other (point or diffuse) P-loads.

Final report (October 2006): **http://ec.europa.eu/enterprise/chemicals/legislation/detergents**

Latest Commission studies on P-use in detergents

The 2003 SCTEE opinion also recommended that:
"further consideration should be given to the risks associated with co-builders (mainly used in zeolite-based detergents)"

DG Enterprise commissioned to RPA Analysts, a study related to:
"Non-surfactant organic ingredients and zeolite-based detergents"

The second part of this report aimed to complement the INIA/Green Planet report, and thereby, offer additional input for the follow-up work on phosphates by:

- ►collating available data on use and properties of STPP and zeolite-based detergents and evaluate the associated health and environmental risks;
- ►assessing the cost and benefits of switching from STPP to zeolite-based detergents.

Final report (June-2006): **http://ec.europa.eu/enterprise/chemicals/legislation/detergents**

RPA: Need for more associated co-builders in P-free detergents

Typical builders by Detergents Types (RPA report)		
Main builder	**STPP**	***Zeolites***
Need for co-builders	STPP forms strong complexes with Ca^{++} and Mg^{++} in solution, preventing their precipitation with the detergent surfactant or as carbonates.	Though zeolites also remove Ca^{++} and Mg^{++} from solution, co-builders are required to remove metals from the surface in textiles.
Additional co-builders	- Sodium Silicate - Sodium Carbonate	- Sodium Silicate -Citric acid & higher concentrations of: -Sodium Carbonate -Polycarboxylates -Phosphonates

RPA further analysis of associated co-builders

Ingredient	***Conclusions from analysis***
Phosphonates	• Degrade slowly (possible environmental risk) • Potential aqual toxicity of HEDP to Daphnia species • No monitoring data on HEDP and its salts • Terrestrial toxicity is low (end up in sewage sludge)
Polycarboxylates	• Not readily biodegradable • Low toxicity and ecotoxicity • No available monitoring data • Concentration in sewage sludge maybe high
Nitriloacetic acid (NTA)	• Potential carcinogenicity (exlc criterio for "eco-labe"l) • NTA trisodium salt classified as Category 3 Carcinogen with an R40 label • Imminent discussion of human health RA at EU level

Overall, RPA recommends that: *The use of phosphate-free detergents should not be encouraged unless all the ingredients can be demonstrated to present no risks to people or to the environment*

RPA Report: Cost & Benefits of Moving to Zeolite-based Detergents

Benefits of Moving to Zeolite Detergents

Key benefit: reducing the phosphorus load to the environment which, in turn, will reduce the problem of eutrophication.

In qualitative terms, **greatest benefits** would accrue in countries with:

- high phosphate detergents use
- low provision of tertiary treatment
- existing severe problem of eutrophication

Benefits of Moving to Phosphate-Free Detergents		
Score	**Description**	**Countries**
>10	*Maximum Benefits*	Chech Republic, Poland, Spain, Latvia, Lithuania, Portugal, Slovakia
5-10	*Some Benefits*	Greece, Cyprus, Estonia, UK, Luxembourg, Hungary Belgium, France
1-5	*Few Benefits*	Denmark, Finland, Austria, Sweden, Ireland, Slovenia, Italy, Netherlands, Germany
0	*No Benefits*	Malta

RPA Report: Cost & Benefits of Moving to Zeolite-based Detergents

Cost of Moving to Zeolite Detergents	
Key points	**Additional Comments**
(1) Disruption of Phosphate Supply chain	- 6 EU manufacturers of STPP would be affected - losses would be offset by expansion of EU zeolite producers
(2) Reformulation and Re-branding	- more complex situation for smaller formulators (SMS) - average cost assumed to be €20k per formulation
(3) Increased Risks to human and environment	- unlikely that such a move would lead to increased risks - further confirmatory evidence of this would be desirable
(4) Additional Costs for Testing	-comprehensive test with full submitted report can be expensive -need for further assessment of risks in some cases (support by Industry-led HERA project, ESR Assessments)

Latest Developments at EU level

► **Reports (RPA & INIA/Green Planet) presented at Detergents WG (Nov,2006)**
Interactive Discussion & exchange of ideas on the way forward, between the participants (Commission Services, MS representatives & Industry)

► **The Commission submitted the Reports to SCHER (Dec., 2006)**
for further evaluation of their scientific quality, methodology & assumptions

Briefly, SCHER was requested:

(I) About the "Eutrophication RA" (INIA/CEEP) Report:
- *to check the quality of conceptual model (field data, develop.-criteria, exposure-assess. etc.)*
- *to evaluate the accuracy and validity of the estimations, results & conclusions*
- *to comment whether use of P-detergents may contribute to eutrophication at EU level.*

(II) About the "Non surfactant Organic & Zeolites" (RPA) Report:
- *to assess whether a move to P-free detergents would increase Health & Environmental risks*
- *to further review the risks of associated co-builders (polycarboxylates, phosphonates, NTA, etc)*

CONCLUSIONS

CONCLUSION-1

The Commission has undertaken the necessary steps to review on the issue of STPP-use in detergents, as required by the Article 16(1) of the Detergents Regulation.
Therefore, by April 2007: *The Commission will have submitted (to EP & Council) a (holding) report about P-use in detergents*

CONCLUSION-2

After: (I) carefully considering the upcoming scientific SCHER opinions
(II) reviewing the findings of ongoing European projects *(UNDP, HELCOM, WFD actions)*
(III) discussing with MS and stakeholders in the EU Detergents Workshops.

The Commission will prepare a final report to conclude:
"as whether the current situation remains unchanged or an EU restriction proposal concerning the P-use detergent formulations should be made"

CONCLUSION-3

Meanwhile, MS can still maintain or introduce legislative measures
(under the condition of their proportionality and adequate justification)

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