Warning and Alarm Plan Rhine
Reported incidents 2011

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1. Introduction

WAP objectives
The objective of the Warning and Alarm Plan (WAP) is, to pass on reports on sudden pollution events with substances noxious to water in the Rhine catchment if the amount and concentration may detrimentally impact water quality and/or the biocoenosis of the Rhine and to warn the authorities in charge of fighting accidents.

The WAP distinguishes between warnings, information and search reports.

The International Main Alert Centres (IHWZ) (see annex 1) issue **warnings** in cases of water pollution incidents implying substances noxious to water, if the amounts or concentrations concerned may detrimentally impact the water quality of the Rhine or drinking water supply along the Rhine.

Information is issued in order to give the IHWZ objective, factual and reliable information independent of the media. Furthermore, the IHWZ inform all Rhine bordering countries in cases of excesses of guidance values. As a precautionary measure, information is also passed on to the drinking water works.

Search reports are issued, in order find the polluter of the Rhine in cases not located within the area of responsibility of an IHWZ.

2. Summary of the reports in 2011

Table 1: Summary of the reports in 2011 (number)

		oil	chemical substances	thereof MTBE/ETBE
Total	31	5	26	6
Warnings[1)]	1	0	1	0
Information	31	5	26	6
Search messages[2)]	1	0	1	0

1) Since the report was first issued as information and subsequently upgraded to a warning it is not separately taken into account in the sum of reports.
2) Since the search report was also passed on as information, it is not included in the total number of reports issued.

Compared to last year (28 reports), the number of reports has slightly risen (to 31), but is still well below the number of reports of past years (2008: 50, 2009: 41). This statistic does not take into account one report (information) which was subsequently attributed to a contamination of samples. In 2011 there was one warning (see chapter 5.1) which was due to chemicals (aniline), while warnings earlier than 2010 were usually due to oil pollution events. When interpreting the changes in the number of chemical pollution reports it must be taken into account that with the successful implementation of the "exchange of information" since 2010, part of the communication concerning conspicuous monitoring results takes place on this informal platform where technical authorities of the German Länder and states exchange information on findings below guidance values of the WAP Rhine and discuss them. In the past, these were more often passed on through the WAP Rhine. During 2007 to 2009, all in all 9 WAP reports were passed on concerning the substances triacetone amine (TAA), diglyme and triglyme. Since the sources were rapidly known, reports on elevated concentrations have since partly been passed on

within the exchange of information (e.g.: TAA 2011: 2 reports passed on through the WAP, 2 by ways of exchange of information).

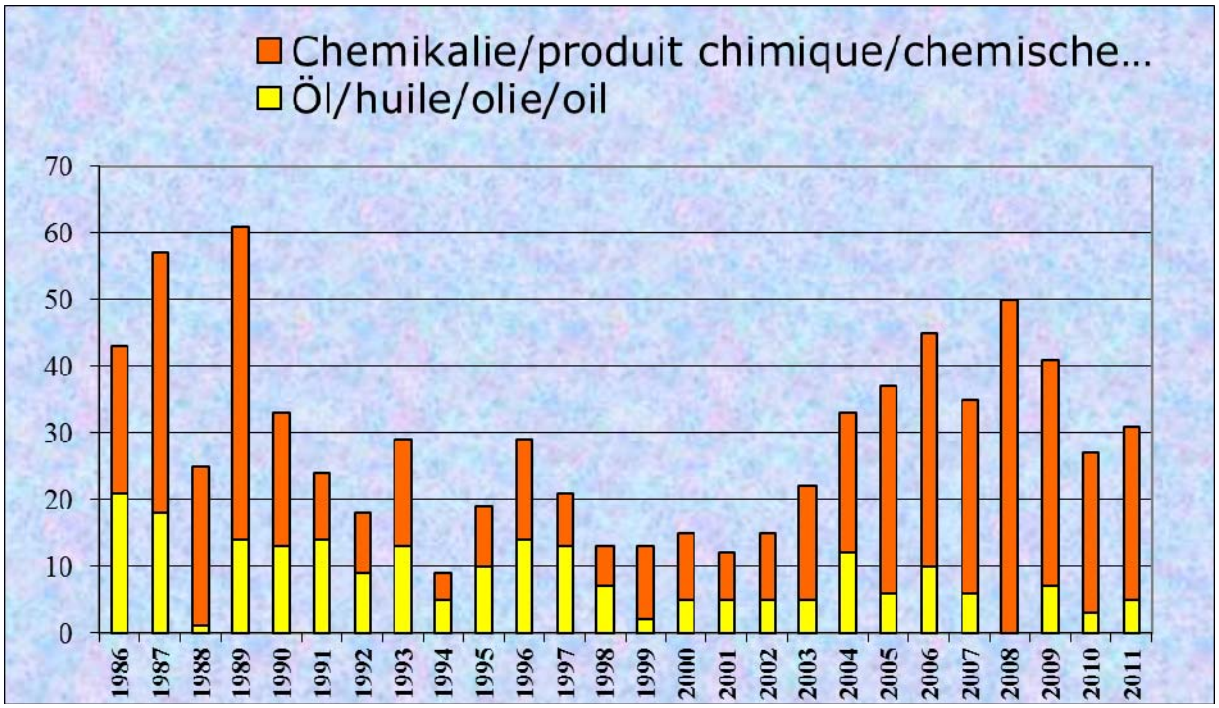
Origin of reports
In 2011, as in the past, a majority of reports (22) was issued by the International Main Warning Centre (IHWZ) R6 in Düsseldorf, 4 more reports were issued by the IHWZ R5 in Koblenz, 2 by the IHWZ R4 in Wiesbaden and one each by R3 (Karlsruhe), R2 (Strasbourg) and R1 (Basel). 19 of the 31 reports issued in 2011 were due to monitoring results at the monitoring stations and were not reported by the polluting companies or ships. Most of the reports issued by monitoring stations were initiated by the international monitoring station in Bimmen-Lobith jointly operated by the Netherlands and Germany. 3 reports were issued by the industry, none by navigation. As in the past, it must also be underlined for 2011 that in spite of the considerable efforts of the river police, the possibilities to find the polluter remain limited. For the first time in the history of the Warning and Alarm Plan Rhine a report issued in 2011 referred to cooling water discharges of a nuclear power plant.

Types of pollutant waves
In 2011, the number of pollutant waves concerned the following chemicals:
6 MTBE/ETBE waves
3 xylen waves
2 waves each concerned triacetone amine and 1.2-dichloroethane.
One wave each concerned aniline, benzene, 3.4-dichloroaniline-6-sulfonic acid, dicyclopentadien, isoproturone, acetic acid, Methyl isocyanat, sodium hypochlorite, PCB, sulphuric acid, THPO, toluene and tributyphosphate.

Raw water intake for drinking water production
Within the Warning and Alarm Plan, the drinking water works are informed of water pollution incidents, but they act on their own responsibility when deciding to stop the raw water intake. Following the cooling water discharge of the nuclear power plant Leibstadt, the raw water intake from the Rhine was stopped even for some major drinking water production plants, such as in Cologne and Rotterdam. In the Dutch Rhine catchment the intake of raw water for drinking water production was reduced as a matter of precaution following pollution waves concerning glyphosate, isoproturone, chlorotolurone and xylene. For precautionary reasons, following the discharge of cooling water originating from the nuclear power plant Leibstadt, the intake for raw water was stopped or changed at certain drinking water works near Leibstadt

3. Long-term development of WAP reports

Graph 1: Development of WAP messages 1986 to 2011



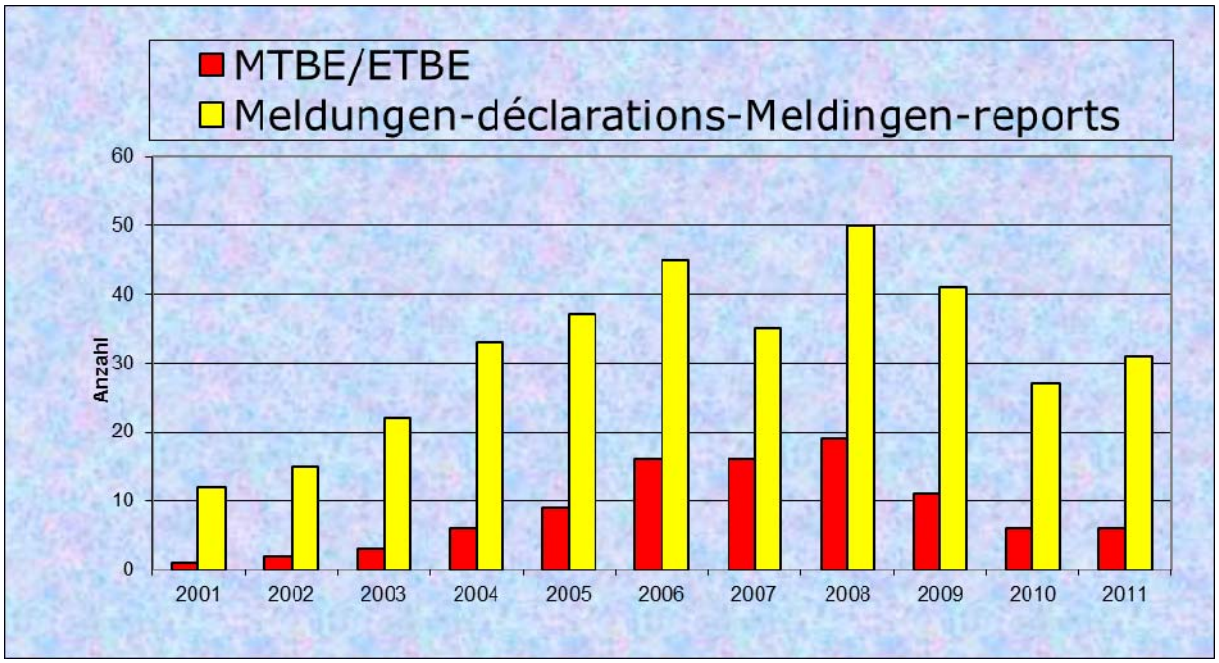
The overall number of WAP-reports (reports on chemicals and oil; diagram 1) has sunk from the end of the 80s to the end of the 90s. Until 2002, its number was constant: 12 reports (annually on average one warning). Since 2003, the number of reports, particularly of reports concerning chemical substances, is again increasing and reached a peak with 50 reports in 2008. In 2010, the number fell to 28 reports. In 2011, a slight rise from 28 to 32 reports has been recorded. The increased number of reports on chemical substances from 2003 on is in particular due to the improved possibilities of analysis in some monitoring stations.

4. Development of MTBE/ETBE reports

Table 2: Development of MTBE/ETBE reports (number)

Year	MTBE/ETBE	Total number of WAP-reports
2001	1	12
2002	2	15
2003	3	22
2004	6	33
2005	9	37
2006	16	45
2007	16	36
2008	19	50
2009	11	41
2010	6	28
2011	6	31

Graph 2: Development of MTBE/ETBE (in black) reports and of the sum of WAP reports (in white) during 2001 to 2011



Development of MTBE/ETBE WAP reports
The first time MTBE (guidance value 3µg/l) was reported within the Warning and Alarm Plan was in 2001. Until 2005, the number of reports rose continuously and experienced a sharp rise in 2006. In 2008, a maximum of 19 reports was registered; in 2010 and 2011 the number of reports again fell to 6.

Experts generally believe **peak discharges** to originate from **tankers**.

Based on present data on transport and movements of ships, the contribution of individual factors to the presently observed reduction of pollutions of the Rhine with MTBE/ETBE from navigation cannot be identified unambiguously. Therefore, it cannot be taken for granted that the situation is sustainably improving. For further information on this subject please refer to the compendium of WAP reports 2010 on the ICPR website (ICPR report no. 191).

5. Warning and WAP report generating great media attention

5.1 Aniline warning 2011

Aniline is a colourless to brown fluid and an important basic chemical applied in the chemical industry. It serves as a basic substance for the synthesis of plastics, synthetic fibres and paint. Aniline is used for the production of pharmaceuticals, rubber, and lether and for producing fuel for space aviation. The substance is harmful to fish and crustaceans.
The pollutant wave was discovered on 25.03.2011 during monitoring at the international monitoring station Bimmen-Lobith on the German-Dutch border. With an aniline concentration of 120 µm/l, the peak of the pollutant wave was reached on 26.03.2011. Given this concentration, harm to sensitive water organisms can no longer be excluded with sufficient certainty. Presumably, navigation discharged the 3.5 to 5.5 tons of aniline into the Rhine. The considerable amounts discharged into the Rhine cannot be due to the flushing of tanks or pumping of polluted ballast water.

5.2 WAP report generating great media attention

On 13 January 2011, the 110 m long tanker „Waldhof“ loaded with about 2 400 tons of sulphuric acid capsized at St. Goarshausen (Rhine km 555) near the legendary Lorely rock. One crew member was found dead in the wreck, a further crew member is still missing, while two crew members were saved. Due to the situation of the damaged vessel in the shipping lane, navigation on the Rhine had to be stopped for 32 days, leading to congestion in navigation both upstream and downstream the accident location.

5 hours after the accident the pH value measured at the international monitoring station Koblenz (Rhine) which equally monitored the transverse river profile slightly fell (by 0.1 to 0.2) thus indicating a slight loss of the load after the accident. After the sulphuric acid came in contact with water, hydrogen developed, leading to a risk of explosion. As the diluted acid affects steel, the sulphuric acid was pumped into a special vessel for transportation towards the BASF works in Ludwigshafen. The strong current during the given flood caused erosion and a 5 m deep pocket under the ship leading to damage due to mechanical stress and the ship was in danger of tilting. Therefore, 07 February 2011 a controlled discharge of the acid was decided. In this connection, some 800 to 1 000 tons of sulphuric acid were discharged into the river, leading to a maximum fall of 0.4 of the pH-value at the Koblenz (Rhine) monitoring station, which was judged to be harmless for the ecosystem and drinking water production. During the pumping operations, a laboratory ship located immediately downstream the tanker took water samples.

In three reports, the relevant information on the accident was rapidly and correctly reported by the IHWZ R5 (Koblenz) using the WAP. The reason for why the Waldhof capsized is still not known.

Media (newspapers, TV, radio and internet) proved to be most interested and the event was covered in Europe, America, Japan and even China.

Photo1: Capsized Waldhof at St. Goarshausen.

Annex 1

Map of the international main warning centres (IHWZ)