Environmental Impact Assessment

July 2017

PAK: Jalalpur Irrigation Project

Project No. 46528-002

Part 9 of 12 of the Appendices

Prepared by Irrigation Department, Government of Punjab for the Asian Development Bank (ADB).

Irrigation Department
Government of Punjab

DETAILED DESIGN OF JALALPUR IRRIGATION PROJECT

Appendices

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

MAY 2017

Detailed Design of Jalalpur Irrigation Project

APPENDICES

EIA

LIST OF APPENDICES

Appendix XI: Letter from Archaeology Department

Ph # 042-99330060-61
Fax # 042-37375370

No. DGA-II(217)/Arch/2017/ 4691
DIRECTORATE GENERAL OF ARCHAEOLOGY
GOVERNMENT OF THE PUNJAB
YOUTH AFFAIRS, SPORTS, ARCHAEOLOGY
AND TOURISM DEPARTMENT

Dated the 17th March, 2017.
21/3

To

The Project Director,
L.B.D.C Improvement Project,
Mustafabad, Lahore.

Subject: - **DESIGN OF JALALPUR IRRIGATION PROJECT ENVIRONMENT IMPACT ASSESSMENT (EIA) STUDY.**

Reference to your letter No: PMU/LBDCIP/ID/JIP/7859 dated 14th December, 2016, I am directed to state that the officer of this directorate visited the proposed alignment of canal and conducted Archaeological Survey of the area along with your officers.

As per report submitted by officers of Directorate General of Archaeology, Government of the Punjab, no Archaeological Site or Monuments comes under the proposed alignment of the route of canal. Accordingly the DGA allowed to carry out EIA studies for proposed alignment of canal.

Mallhan
DEPUTY DIRECTOR (Hqr)

INWARD MAIL	
Diary No	22536
Date	24-3-17
Time	
DIRECTORS	
Procurement	
Finance & Admn	
Social & Environment	
Engineering (LBDC)	
CEO Sahiwal	
Office Manager	

9018
27-3-17

JIP. Consultant.

27/3/17

Appendix XII: Detailed Proceedings and Photographs of the Workshops

Appendix XII: Detailed Proceedings and Photographs of the Workshops

Stakeholders Consultation Workshop (Jilalpur Irrigation Project)

Date: August 12, 2015

Venue: Al Hayat Restaurant near Al Beruni Degree College, Khawera Road, Pind Dadan Khan

Time	Event
09:30-10:00	Registration*
10:00-10:05	Recitation from the Holy Quran
10:05-10:15	Welcome remarks by Dr. Abdul Majid, ICARDA
10:15-10:30	Overview of the project by Dr. Muhammad Ashraf
10:30-10:40	Inaugural remarks by Mr. Afzal Toor, Deputy General Manager PIDA (TBC)
10:40-11:10	Tee break
11:10-11:50	Involvement of Community in Irrigation System Management: Experience from LBDC and LCC by Mr. Abdul Hameed
11:50-12:30	Improving land and water productivity in the proposed JIP: Possible interventions (Dr. Abdul Majeed)
12:30-13:30	Q&A and General discussions
13:30-13:40	Concluding remarks (TBN)
13:40-13:45	Vote of thanks by Dr. Ashraf
13:45	Lunch and prayer

*40-50 participants from PID, PIDA, OFWM, Agri. Extension, ASPs, NGOs, COs, NRSP and progressive farmers from the project area

Contact person at PD Khan: Ch. Muzammal Ali, NRSP Field Unit Incharge (Cell: 0300-6996545; 0345-9902225)

Preamble/Background

The Jalalpur Irrigation Project (JIP) aims at increasing crop production and reducing land degradation by minimizing use of marginal quality groundwater. The project proposes to (i) construct main canal, distribution system and appurtenant structures, (ii) introduce institutional reforms and establish Farmers' Organizations (FOs), and (iii) build capacity of the farmers (men and women), FOs and the staff from the Punjab Irrigation Department (PID) and Punjab Irrigation and Drainage Authority (PIDA).

Asian Development Bank, the main sponsors of the Project awarded Consultancy to NESPAK-ICS for preparing a technically viable, economically feasible, environmentally and operationally sustainable, and socially acceptable project. International Center for Agriculture in Arid Areas (ICARDA) was assigned supportive role to undertake comprehensive studies on (social) community development and agricultural (on-farm water management) aspects of the Consultancy. In agreement with ADB, ICARDA recruited a local NGO viz. National Rural Support Programme (NRSP) for undertaking studies related with the social aspects.

The project will construct over 100 km of main canal and around 200 km of distributary and minor canals and appurtenant structures (Fig. 1). The main canal will have a design discharge of about 38 m^3/s (1342 cusecs) at Rasul Barrage. Provision for the canal headwork already exists at the existing Rasul Barrage on River Jhelum. The project will provide irrigation supplies to about 79,750 ha in Pind Daden Khan and Khushab districts out of which around 15,000 ha will require lift irrigation from the River Jhelum with possibility of using solar energy pumps. The non-perennial irrigation system - water supply for only Kharif season crops from April to September, will directly benefit rural population of about 500,000. The project will also include summer crops (Rabi crops) using groundwater.

Under the administrative arrangements, Punjab Irrigation Department is the executing agency of the Project and Punjab Irrigation and Drainage Authority (PIDA) is responsible for implementing the institutional component of the Project.

It was essential to involve all stakeholders in the process right from the beginning to get their due share in the planning process. The stakeholders include the local user communities in the two districts of Khushab and Pind Dadan Khan, the local governments and line departments and other stakeholders including beneficiaries (water users). Keeping this in mind, ICARDA and NRSP jointly organized a one-day consultative workshop in Pind Dadan Khan on October 14, 2014 to take the stakeholders on board regarding the Project aims and objectives and to get their feedback.

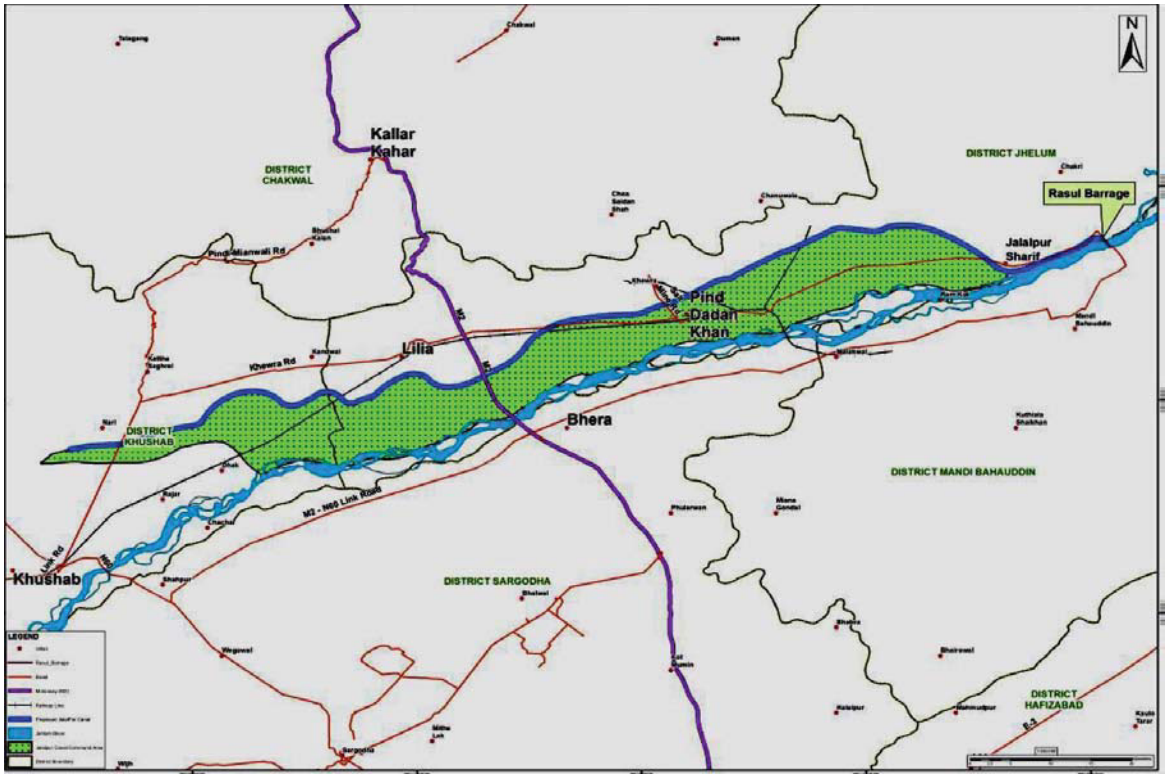

Fig.1: Location of the Canal

This report contains the Workshop proceedings and the feedback that was received from the stakeholders who participated.

Participants

The Workshop was attended over 50 participents from the following relevant line departments, Non-Governmental Organizaions (NGOs), private sector and beneficiaries:

1. Punjab Irrigation Department (PID);
2. On-Farm Water Management (OFWM) and Agriculture Extenson (AE) directorates of Punjab Agriculture Department (PAD);
3. Agriculture Service Provider (ASPs);
4. National Rural Support Program (NRSP);
5. Local Community Organizations (COs); and
6. Farmers of the project area.
7. ICARDA consultants

List of participents is attached as Appendix-10.1.

Proceedings

Inaugural Session

The inaugural session was chaired by Malik Fateh Khan Programme Leader NRSP. The Workshop formally started with Recitation from the Holy Quran by one of the participants representing the local community. After a round of introductions, Dr. Muhammad Ashraf, Team Leader ICARDA welcomed the participants and highlighted the importance of water in the light of Holy Quran and *Ahadees-e-Mubarakah*. Using power point presentation, he bried the participants on water requirements for producing food and why irrigation is essential in food production in Pakistan laying stress on methods of irrigation and how water can be beneficially applied to crops. After explaining the purpose for holding the workshop, he provided a detailed background of the project and the benefits the project will accrue after completion. He then gave a detailed insight into the salient features of the project such as lengths of canals and distributaries, dessign discharges, irrigated areas and irrigation systems, etc. He explained the purpose for holding the workshop and placed the following set of important questions before the participants:

1. What are the major issues of the project area?
2. What kind of agricultural practices should be in place?
3. What kind of on farm water management practices should be adopted?
4. What should be the institutional arrangements?

Mr. Muhammad Islam Bhatti, Executive Engineer, PID at Jhelum gave his remarks and also discussed the project details. He assured full cooperation of his department and requested the participants to extend their full support to the Consultants so that the Project Feasibility is developed in a participatory manner with full stakeholders' involvement. Mr. Rafaquat Ali, Team Leader NESPAK-ICS also provided details about the project and its benefits.

Malik Fateh Khan in his inaugural address highlighted the importance of the project for the area and assured full support of his team that had vast experience of working with the community in the area.

Group Sessions

Four groups were formed from amongst the participants to discuss and arrive at the consensus answers. Efforts were made to ensure that each of the groups had representative(s) of the implementing agencies, the beneficiaries, the Agriculture Service Providers, and the consultants.

The four groups discussed in detail the questions posed by the ICARDA Consultants' Team Leader. The members very actively participated in discussions and debated on the answers to the questions. They used flip charts for preparing their answers. Group leaders from each group presented the outcome of the deliberation followed by questions and answers. Their responses to the questions are given in the **Matrix 1**:

Matrix 1: Questions and Responses of the Groups

Question	Answers			
	Group 1	Group 2	Group 3	Group 4
What are the major issues of the project area?	• Waterlogging and associated salinity problems are widespread • Agricultural lands are uneven • Most lands are barren but could be made productive	• Extreme shortage of water that limits agricultural production on a large scale • Effluent discharge of ICI factory brings in lots of chemicals that damage lands and reduce productivity besides polluting the water sources • Floods bring in salts from nearby exposed salt mines in the mountainous areas • Seepage from channels causes waterlogging and salinity problems • Lack of cold storage facilities to store agricultural produce for later selling • Non-availability of proper and quality seeds and fertilizers	• The flood waters from the mountains is salty that limits agricultural production • Effluent discharge of ICI factory brings in lots of chemicals that damage lands and reduce productivity besides polluting the water sources • Extreme shortage of water so much so that even drinking water is difficult to access • Lack of marketing system • Seed and fertilizer availability conditions are poor.	• Shortage of water for irrigation due to which agricultural production is limited despite available good, even and fertile lands • Saline water is available but cannot be used for irrigation to raise agricultural production • Seepage from channels is prevalent in almost 50% of agricultural lands
What kind of agricultural practices should be in place?	• Uneven lands need Laser land leveling	• Farmer training program should be started	• Easy access to new agricultural technologies that allow	• Access to newer conservation agriculture practices like zero

Question	Answers			
	Group 1	Group 2	Group 3	Group 4
	• Agricultural machinery should be made available to improve the fertility level of barren land • Gypsum should be provided to improve land productivity • Proper marketing need to be provided • Provision of proper transport facilities to improve accessibility to markets	• Agriculture machinery should be available at Union Council level • Agricultural loans should be available at easy terms	efficient use of water from rainfall and canals	tillage, bed and furrow etc. • Undertake exhaustive training programs for farmers of the area.
What kind of on farm water management practices should be adopted?	• Line the irrigation canal systems to avoid seepage and thus reduce effects of waterlogging and salinity • Due to proximity to exposed salt mines, flood waters damage the crops, so amelioration measures need to be taken • Agricultural fields need to be leveled.	• Flood irrigation needs to be replaced with efficient methods suited to different crops • Raised bed and furrow systems need to be introduced • Crop varieties need to be introduced that take lesser time for maturity • Water courses should be lined to reduce seepage	• Water courses must be lined to ensure that no wastage of water occurs and waterlogging problems are reduced.	• Where there are seepage problems, appropriate drainage systems should be introduced • Water should be available in canal for the whole year so that the farmers can grow annual crops like orchards
What should be the institutional arrangements?	• There should be justice in water distribution from head to tail for which the	• Working Committees should be formed at Union Council level	• Justice in water distribution from end to tail must be ensured	• All institutional arrangements to operate and maintain the

Question	Answers			
	Group 1	**Group 2**	**Group 3**	**Group 4**
	timing of tail water user should be doubled the timing for the head user • Piped system of water delivery should be installed due to extreme shortage of water in mountainous areas • All watercourses need to be lined and maintained at Union Council level • Steps should be taken to avoid stealing of water • The irrigation systems should be managed by respective FOs at UC level • Exhaustive training programs should be implemented for farmers to increase their know-how about new agricultural and water management technologies	• Adequate legislation needs to be in place to ensure that all water users are properly registered • Women also should actively participate in all activities related with agriculture and water management • There should be justice in division of water from tail to end • All user should timely pay the bills of supply of canal water	• Farmers should timely pay all bills of water used at the farm • Women should also play role in agriculture operation	irrigation system should be left with the Government except in lined water courses which should be under local community

Conclusions

After presentations of the Groups general discussions took place. It was concluded that:

1. Because of previous history with this project, the farmers were somewhat apprehensive that this canal may not after all be constructed once again. However, the Consultants and the line department officials assured them that this time this would not be the case.

2. Water shortage and seepage are some of the major problems in the area. In some areas water table is very high for which steps like lining the canal in such sections need to be taken.

3. Training programs for farming communities in new agricultural and water management practices and technologies should be organized. This can be done through lectures, films, videos, farmers field schools, and demonstration projects.

4. Steps should be taken to ensure that pollution of water bodies and good agricultural lands by effluents from nearby industries is controlled by enforcing existing legislation under the Environmental Protection Act.

5. There was some disagreement on who is to operate and maintain the irrigation systems and water distribution. However in lined water courses areas the consensus was that the FOs may operate and maintain the systems while the main irrigation system should be left to the Government.

List of Participants

S. No.	Name	Designation, Address
1	Mr. Muhammed Islam Bhatti	XEN-Upper Jehlum Canal. Jhelum
2	Malik Fatah Khan	Programme Leader, NRSP
3	M. Zubair Chaudhry	RPO-NRSP Jhelum
4	M. Afsar Noor	LSO, Harran Pur
5	Mr. Rafaquat Ali	Team leader , Jalalpur Irrigation Project, NESPAK
6	Mr. Asad Mahmood	Sub Engineer, Punjab Irrigation Department, Jehlum
7	Mr. Sultan Ahmad	Farmer
8	Mr. Tajammal Khan	Chairman (LSO) Haroon Pur
9	Haji Nisar Ahmad	Farmer
10	Ch. Ahmad Khan	Admn Officer R/B College
11	Mirza Anmbar Khan	Chairman LSO
12	Mr. Spkandar Khan	LSO Gujjar
13	Mr. M. Ram Zam	Farmer, Kaslim
14	Raja M. Hayat	CO, Dattar
15	Haji M. Aslam	Farmer
16	Haji Sarskham	Farmer
17	M. HussainRaza	DDO, Agri Extension, Pind Dadan Khan
18	Ch. Muzamal Ali	Senior Credit Officer, NRSP Pind Dadan Khan
19	Mr. Mazahar Abbas	L.S.O Gujjar
20	Mr. Kazim Raja	Assistant Accountant, NRSP Pind Dadan Khan
21	Ms. Hina Shahid	F.A NRSP, Pind Dadan Khan
22	Ms. Shumaila Kanwal	F.A NRSP, PD Khan
23	Mr. Abdur Rehman	NESPAK, Lahore
24	Mr. Abdul Hameed	Community Development Consultant, ICARDA
25	Ch. Muhammad Raj	President, CO
26	Mr. Amir Ahmad	Manager, CO
27	Mr. Dilawar Ali	Finance Secretary, LSO, Gujjar
28	Mr. Muhammad Uzair	Deputy Team leader NESPAK-ICS, Lahore
29	Mr. Khalil Khan	Farmer, Azampur. Pind Dadan Khan
30	Raja WaseemHaider	Farmer, Dharayala village PD Khan
31	Mr. Muhammad Waseem	OFWM, PD Khan
32	Mr. Qaiser Ahmood	DDO, OFWM
33	Mr. Mukhtar Ahmad	Farmer, Village Usnoon.S

S. No.	Name	Designation, Address
34	Mr. Abdul Majeed	Farmer, Village Usnoon
35	Haji Allah Bakhsh	Farmer, Kora Shamas
36	Mr. Zahoor Ahmad	Farmer, PD Khan
37	Mr. Atta Muhammad	CO, Athrer
38	Mr. Tahir Mahmood	CO, Athrer
39	Mr. Muhammad Tanveer Anjam	CO, Athrer
40	Haji Muhammad Akhtar	Farmer, PD Khan
41	Mr. Allah Bakhsh	Farmer, PD Khan
42	Mr. Dhaman Khan	Farmer, PD Khan
43	Mr. Mnzoor Hussain	Farmer, PD Khan
44	Dr. Abdul Majeed	OFWM Specialist, ICARDA
45	Mr. Abdul Latif Chodhry	Agriculture Specialist, ICARDA
46	Mr. Raja Zafar	LSO, PD Khan
47	Mr. Raja Sikandar	LSO , PD Khan
48	Mr. M. Boota Khan	Farmer, PD Khan
49	Mr. Mumtaz Ahmad Noon	Farmer, PD Khan
50	Mr. Asghar Ali	Farmer, PD Khan
51	Mr. Sana Ullah	Farmer, PD Khan
52	Mr. Naseem	Farmer, Baghanwala
53	Mr. Nasir ALI	Farmer, Baghanwala
54	Ms Ambreen Fatima	Research Associate, ICARDA
55	Dr. Muhammad Ashraf	Team Leader ICARDA

Some Pictorial of the Consultative Workshop


ICARDA


NRSP
s Consultation Workshop
lpur Irrigation Project
Organized By


SONY

Appendix XIII: Project Impact Evaluation Matrix

PROJECT IMPACT EVALUATION MATRIX

Environmental Impacts / Project Activities	Air Quality	Noise Pollution	Soil Contamination/ Erosion	Waste Disposal	Surface Water Quality	Ground Water Quality	Migratory Avi-fauna	Flora	Fauna	Fishery	Disruption to Public Life	Mobility of Locals	Cultural Issues	Gender Issues	Health & Safety of Workers	Protected Areas	Floods	Agriculture	Water Distribution	Livelihood	Resettlement
A. Design and Pre-construction Stage																					
Design Stage Investigations	x	x	o	o	o	x	x	x	x	o	o	o	x	x	o	o	o	x	o	●	o
Land Acquisition	o	o	o	o	o	o	o	o	o	o	o	X	x	x	o	o	o	X	x	X	x
B. Construction Stage																					
Clearing of Land, Digging and Excavation	x	x	X	x	x	x	x	x	x	x	o	x	x	x	x	o	x	X	x	●	o
Construction of access roads within the Project Area	X	x	x	x	X	x	x	x	x	o	o	x	x	x	x	o	x	X	x	●	o
Storage of Material	x	x	o	x	x	x	o	o	o	o	o	o	o	x	o	o	x	o	o	o	o
Installation of Construction Camps	x	X	x	X	X	X	x	x	x	o	o	x	x	x	x	o	X	x	o	●	o
Construction Activties	x	x	x	X	X	x	x	x	x	x	x	X	o	x	X	o	x	x	X	●	o
Use of Heavy Machinery/Equip	X	X	x	x	o	o	x	x	x	x	x	x	o	o	x	o	x	x	X	●	o
Waste Water Disposal	o	o	x	x	X	x	X	x	x	x	X	o	o	o	x	o	x	X	x	o	o
Solid Waste Disposal	x	o	x	x	x	x	o	x	x	x	o	o	o	o	x	o	x	x	x	o	o
Leakage & Spillage of Oils and Chemicals	x	o	x	x	x	x	x	x	x	x	o	o	o	o	x	o	x	o	x	o	o
Security Fencing and Lightning	o	●	o	o	o	o	o	o	x	o	o	x	o	o	x	o	o	o	o	o	o
C. Operational Stage																					
Plantation	●	o	o	●	o	o	o	●	●	o	o	o	o	o	o	o	o	o	o	●	o
Command Area Development	o	x	o	x	x	x	x	●	●	x	o	x	x	o	x	o	x	x	x	●	o

NOTE: The above matrix shows the imapct magnitude without any mitigation. With the application of mitigation, the magnitude of impacts will be either insigficant or low.

Beneficial		Adverse
●	Low	x
●	Medium	x
●	High	x

o Insignificant or No Impact

Appendix XIV: Commodity Prices as per Directorate of Agriculture Punjab

Appendix XIV: Commodity Prices as per Directorate of Agriculture Punjab

Agriculture Marketing Information Service.

Directorate of Agriculture (Economics & Marketing) Punjab, Lahore.

Commodity: Wheat [All Prices are in Rs. /100 Kg specified otherwise]
05-Jan-2015

Price Date: Jan5, 2015	Min	Max	FQP	Arrival Quantity(in Quintals)
Khushab	3100	3200	3150	-
Mindi Bhauddin	3250	3375	3313	-

1 Quintal = 100 Kg

Source: **http://www.amis.pk/ViewPrices.aspx?searchType=0&commodityId=1**
Agriculture Marketing Information Service Directorate of Agriculture (Economics & Marketing) Punjab, Lahore
Note: On the receipt of data from Agriculture office, this table will be updated

Appendix XV: Noise Modeling for the Prediction of Noise Levels on Sensitive Receptors during Construction Phase

Appendix XV: Noise Modeling for the Prediction of Noise Levels on Sensitive Receptors during Construction Phase

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 20 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E. L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	20	0.4	77	90.6
	Concrete Pump Mobile	82	76	6	1	0	82	20	0.4	76	
	Concrete Static Pump	82	79	3	1	0	82	20	0.4	76	
	Transit Mixture	85	80	5	1	0	85	20	0.4	79	
	Loader	85	82	3	1	0	85	20	0.4	79	
	Grader	85	83	2	1	0	85	20	0.6	80	
	Excavator (Type)	85	84	1	1	0	85	20	0.5	80	
	Excavator (Chain)	85	85	0	1	0	85	20	0.3	77	
	Dumper	80	75	5	1	0	80	20	0.4	74	
	Mobile Crain	85	83	2	1	0	85	20	0.2	76	
	Truck Crain	85	83	2	1	0	85	20	0.2	76	
	Mate Compactor	80	80	0	1	0	80	20	0.5	75	
	Mini Roller (MRL)	85	78	7	1	0	85	20	0.2	76	
	Mini Truck	55	54	1	1	0	55	20	0.4	49	
	Tractor	84	80	4	1	0	84	20	0.4	78	
	Tractor Trolley	84	79	5	1	0	84	20	0.4	78	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	20	0.3	77	
	Steel Cutting Machine	85	85	0	1	0	85	20	0.4	79	
	Steel Bending Machine	80	79	1	1	0	80	20	0.5	75	
	Water Bowzer	80	75	5	1	0	80	20	0.2	71	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	Fuel Pump	82	80	2	1	0	82	20	0.4	76	
	Power Generator	82	80	2	1	0	82	20	0.4	76	
	Welding Plant (Diesel)	72	70	2	1	0	72	20	0.4	66	
	Dewatering Pump (Diesel)	77	73	4	1	0	77	20	0.5	72	
	Dewatering Pump (Petrol)	77	72	5	1	0	77	20	0.5	72	
	Trailer	84	78	6	1	0	84	20	0.6	79	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 70 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	70	0.4	66	79.8
	Concrete Pump Mobile	82	76	6	1	0	82	70	0.4	65	
	Concrete Static Pump	82	79	3	1	0	82	70	0.4	65	
	Transit Mixture	85	80	5	1	0	85	70	0.4	68	
	Loader	85	82	3	1	0	85	70	0.4	68	
	Grader	85	83	2	1	0	85	70	0.6	70	
	Excavator (Type)	85	84	1	1	0	85	70	0.5	69	
	Excavator (Chain)	85	85	0	1	0	85	70	0.3	67	
	Dumper	80	75	5	1	0	80	70	0.4	63	
	Mobile Crain	85	83	2	1	0	85	70	0.2	65	
	Truck Crain	85	83	2	1	0	85	70	0.2	65	
	Mate Compactor	80	80	0	1	0	80	70	0.5	64	
	Mini Roller (MRL)	85	78	7	1	0	85	70	0.2	65	
	Mini Truck	55	54	1	1	0	55	70	0.4	38	
	Tractor	84	80	4	1	0	84	70	0.4	67	
	Tractor Trolley	84	79	5	1	0	84	70	0.4	67	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	70	0.3	67	
	Steel Cutting Machine	85	85	0	1	0	85	70	0.4	68	
	Steel Bending Machine	80	79	1	1	0	80	70	0.5	64	
	Water Bowzer	80	75	5	1	0	80	70	0.2	60	
	Fuel Pump	82	80	2	1	0	82	70	0.4	65	
	Power Generator	82	80	2	1	0	82	70	0.4	65	
	Welding Plant (Diesel)	72	70	2	1	0	72	70	0.4	55	
	Dewatering Pump	77	73	4	1	0	77	70	0.5	61	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	70	0.5	61	
	Trailer	84	78	6	1	0	84	70	0.6	69	

Appendix XV: Noise Modeling for the Prediction of Noise Levels on Sensitive Receptors during Construction Phase

Appendix XV: Noise Modeling for the Prediction of Noise Levels on Sensitive Receptors during Construction Phase

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 20 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E. L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	20	0.4	77	90.6
	Concrete Pump Mobile	82	76	6	1	0	82	20	0.4	76	
	Concrete Static Pump	82	79	3	1	0	82	20	0.4	76	
	Transit Mixture	85	80	5	1	0	85	20	0.4	79	
	Loader	85	82	3	1	0	85	20	0.4	79	
	Grader	85	83	2	1	0	85	20	0.6	80	
	Excavator (Type)	85	84	1	1	0	85	20	0.5	80	
	Excavator (Chain)	85	85	0	1	0	85	20	0.3	77	
	Dumper	80	75	5	1	0	80	20	0.4	74	
	Mobile Crain	85	83	2	1	0	85	20	0.2	76	
	Truck Crain	85	83	2	1	0	85	20	0.2	76	
	Mate Compactor	80	80	0	1	0	80	20	0.5	75	
	Mini Roller (MRL)	85	78	7	1	0	85	20	0.2	76	
	Mini Truck	55	54	1	1	0	55	20	0.4	49	
	Tractor	84	80	4	1	0	84	20	0.4	78	
	Tractor Trolley	84	79	5	1	0	84	20	0.4	78	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	20	0.3	77	
	Steel Cutting Machine	85	85	0	1	0	85	20	0.4	79	
	Steel Bending Machine	80	79	1	1	0	80	20	0.5	75	
	Water Bowzer	80	75	5	1	0	80	20	0.2	71	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	Fuel Pump	82	80	2	1	0	82	20	0.4	76	
	Power Generator	82	80	2	1	0	82	20	0.4	76	
	Welding Plant (Diesel)	72	70	2	1	0	72	20	0.4	66	
	Dewatering Pump (Diesel)	77	73	4	1	0	77	20	0.5	72	
	Dewatering Pump (Petrol)	77	72	5	1	0	77	20	0.5	72	
	Trailer	84	78	6	1	0	84	20	0.6	79	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 70 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	70	0.4	66	79.8
	Concrete Pump Mobile	82	76	6	1	0	82	70	0.4	65	
	Concrete Static Pump	82	79	3	1	0	82	70	0.4	65	
	Transit Mixture	85	80	5	1	0	85	70	0.4	68	
	Loader	85	82	3	1	0	85	70	0.4	68	
	Grader	85	83	2	1	0	85	70	0.6	70	
	Excavator (Type)	85	84	1	1	0	85	70	0.5	69	
	Excavator (Chain)	85	85	0	1	0	85	70	0.3	67	
	Dumper	80	75	5	1	0	80	70	0.4	63	
	Mobile Crain	85	83	2	1	0	85	70	0.2	65	
	Truck Crain	85	83	2	1	0	85	70	0.2	65	
	Mate Compactor	80	80	0	1	0	80	70	0.5	64	
	Mini Roller (MRL)	85	78	7	1	0	85	70	0.2	65	
	Mini Truck	55	54	1	1	0	55	70	0.4	38	
	Tractor	84	80	4	1	0	84	70	0.4	67	
	Tractor Trolley	84	79	5	1	0	84	70	0.4	67	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	70	0.3	67	
	Steel Cutting Machine	85	85	0	1	0	85	70	0.4	68	
	Steel Bending Machine	80	79	1	1	0	80	70	0.5	64	
	Water Bowzer	80	75	5	1	0	80	70	0.2	60	
	Fuel Pump	82	80	2	1	0	82	70	0.4	65	
	Power Generator	82	80	2	1	0	82	70	0.4	65	
	Welding Plant (Diesel)	72	70	2	1	0	72	70	0.4	55	
	Dewatering Pump	77	73	4	1	0	77	70	0.5	61	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	70	0.5	61	
	Trailer	84	78	6	1	0	84	70	0.6	69	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 100 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	100	0.4	63	76.7
	Concrete Pump Mobile	82	76	6	1	0	82	100	0.4	62	
	Concrete Static Pump	82	79	3	1	0	82	100	0.4	62	
	Transit Mixture	85	80	5	1	0	85	100	0.4	65	
	Loader	85	82	3	1	0	85	100	0.4	65	
	Grader	85	83	2	1	0	85	100	0.6	66	
	Excavator (Type)	85	84	1	1	0	85	100	0.5	66	
	Excavator (Chain)	85	85	0	1	0	85	100	0.3	63	
	Dumper	80	75	5	1	0	80	100	0.4	60	
	Mobile Crain	85	83	2	1	0	85	100	0.2	62	
	Truck Crain	85	83	2	1	0	85	100	0.2	62	
	Mate Compactor	80	80	0	1	0	80	100	0.5	61	
	Mini Roller (MRL)	85	78	7	1	0	85	100	0.2	62	
	Mini Truck	55	54	1	1	0	55	100	0.4	35	
	Tractor	84	80	4	1	0	84	100	0.4	64	
	Tractor Trolley	84	79	5	1	0	84	100	0.4	64	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	100	0.3	63	
	Steel Cutting Machine	85	85	0	1	0	85	100	0.4	65	
	Steel Bending Machine	80	79	1	1	0	80	100	0.5	61	
	Water Bowzer	80	75	5	1	0	80	100	0.2	57	
	Fuel Pump	82	80	2	1	0	82	100	0.4	62	
	Power Generator	82	80	2	1	0	82	100	0.4	62	
	Welding Plant (Diesel)	72	70	2	1	0	72	100	0.4	52	
	Dewatering Pump	77	73	4	1	0	77	100	0.5	58	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	100	0.5	58	
	Trailer	84	78	6	1	0	84	100	0.6	65	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 175 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	175	0.4	58	71.8
	Concrete Pump Mobile	82	76	6	1	0	82	175	0.4	57	
	Concrete Static Pump	82	79	3	1	0	82	175	0.4	57	
	Transit Mixture	85	80	5	1	0	85	175	0.4	60	
	Loader	85	82	3	1	0	85	175	0.4	60	
	Grader	85	83	2	1	0	85	175	0.6	62	
	Excavator (Type)	85	84	1	1	0	85	175	0.5	61	
	Excavator (Chain)	85	85	0	1	0	85	175	0.3	59	
	Dumper	80	75	5	1	0	80	175	0.4	55	
	Mobile Crain	85	83	2	1	0	85	175	0.2	57	
	Truck Crain	85	83	2	1	0	85	175	0.2	57	
	Mate Compactor	80	80	0	1	0	80	175	0.5	56	
	Mini Roller (MRL)	85	78	7	1	0	85	175	0.2	57	
	Mini Truck	55	54	1	1	0	55	175	0.4	30	
	Tractor	84	80	4	1	0	84	175	0.4	59	
	Tractor Trolley	84	79	5	1	0	84	175	0.4	59	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	175	0.3	59	
	Steel Cutting Machine	85	85	0	1	0	85	175	0.4	60	
	Steel Bending Machine	80	79	1	1	0	80	175	0.5	56	
	Water Bowzer	80	75	5	1	0	80	175	0.2	52	
	Fuel Pump	82	80	2	1	0	82	175	0.4	57	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	Power Generator	82	80	2	1	0	82	175	0.4	57	
	Welding Plant (Diesel)	72	70	2	1	0	72	175	0.4	47	
	Dewatering Pump (Diesel)	77	73	4	1	0	77	175	0.5	53	
	Dewatering Pump (Petrol)	77	72	5	1	0	77	175	0.5	53	
	Trailer	84	78	6	1	0	84	175	0.6	61	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 200 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	200	0.4	57	70.6
	Concrete Pump Mobile	82	76	6	1	0	82	200	0.4	56	
	Concrete Static Pump	82	79	3	1	0	82	200	0.4	56	
	Transit Mixture	85	80	5	1	0	85	200	0.4	59	
	Loader	85	82	3	1	0	85	200	0.4	59	
	Grader	85	83	2	1	0	85	200	0.6	60	
	Excavator (Type)	85	84	1	1	0	85	200	0.5	60	
	Excavator (Chain)	85	85	0	1	0	85	200	0.3	57	
	Dumper	80	75	5	1	0	80	200	0.4	54	
	Mobile Crain	85	83	2	1	0	85	200	0.2	56	
	Truck Crain	85	83	2	1	0	85	200	0.2	56	
	Mate Compactor	80	80	0	1	0	80	200	0.5	55	
	Mini Roller (MRL)	85	78	7	1	0	85	200	0.2	56	
	Mini Truck	55	54	1	1	0	55	200	0.4	29	
	Tractor	84	80	4	1	0	84	200	0.4	58	
	Tractor Trolley	84	79	5	1	0	84	200	0.4	58	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	200	0.3	57	
	Steel Cutting Machine	85	85	0	1	0	85	200	0.4	59	
	Steel Bending Machine	80	79	1	1	0	80	200	0.5	55	
	Water Bowzer	80	75	5	1	0	80	200	0.2	51	
	Fuel Pump	82	80	2	1	0	82	200	0.4	56	
	Power Generator	82	80	2	1	0	82	200	0.4	56	
	Welding Plant (Diesel)	72	70	2	1	0	72	200	0.4	46	
	Dewatering Pump	77	73	4	1	0	77	200	0.5	52	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	200	0.5	52	
	Trailer	84	78	6	1	0	84	200	0.6	59	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 300 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	300	0.4	53	67.1
	Concrete Pump Mobile	82	76	6	1	0	82	300	0.4	52	
	Concrete Static Pump	82	79	3	1	0	82	300	0.4	52	
	Transit Mixture	85	80	5	1	0	85	300	0.4	55	
	Loader	85	82	3	1	0	85	300	0.4	55	
	Grader	85	83	2	1	0	85	300	0.6	57	
	Excavator (Type)	85	84	1	1	0	85	300	0.5	56	
	Excavator (Chain)	85	85	0	1	0	85	300	0.3	54	
	Dumper	80	75	5	1	0	80	300	0.4	50	
	Mobile Crain	85	83	2	1	0	85	300	0.2	52	
	Truck Crain	85	83	2	1	0	85	300	0.2	52	
	Mate Compactor	80	80	0	1	0	80	300	0.5	51	
	Mini Roller (MRL)	85	78	7	1	0	85	300	0.2	52	
	Mini Truck	55	54	1	1	0	55	300	0.4	25	
	Tractor	84	80	4	1	0	84	300	0.4	54	
	Tractor Trolley	84	79	5	1	0	84	300	0.4	54	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	300	0.3	54	
	Steel Cutting Machine	85	85	0	1	0	85	300	0.4	55	
	Steel Bending Machine	80	79	1	1	0	80	300	0.5	51	
	Water Bowzer	80	75	5	1	0	80	300	0.2	47	
	Fuel Pump	82	80	2	1	0	82	300	0.4	52	
	Power Generator	82	80	2	1	0	82	300	0.4	52	
	Welding Plant (Diesel)	72	70	2	1	0	72	300	0.4	42	
	Dewatering Pump	77	73	4	1	0	77	300	0.5	48	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	300	0.5	48	
	Trailer	84	78	6	1	0	84	300	0.6	56	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 500 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	500	0.4	49	62.7
	Concrete Pump Mobile	82	76	6	1	0	82	500	0.4	48	
	Concrete Static Pump	82	79	3	1	0	82	500	0.4	48	
	Transit Mixture	85	80	5	1	0	85	500	0.4	51	
	Loader	85	82	3	1	0	85	500	0.4	51	
	Grader	85	83	2	1	0	85	500	0.6	52	
	Excavator (Type)	85	84	1	1	0	85	500	0.5	52	
	Excavator (Chain)	85	85	0	1	0	85	500	0.3	49	
	Dumper	80	75	5	1	0	80	500	0.4	46	
	Mobile Crain	85	83	2	1	0	85	500	0.2	48	
	Truck Crain	85	83	2	1	0	85	500	0.2	48	
	Mate Compactor	80	80	0	1	0	80	500	0.5	47	
	Mini Roller (MRL)	85	78	7	1	0	85	500	0.2	48	
	Mini Truck	55	54	1	1	0	55	500	0.4	21	
	Tractor	84	80	4	1	0	84	500	0.4	50	
	Tractor Trolley	84	79	5	1	0	84	500	0.4	50	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	500	0.3	49	
	Steel Cutting Machine	85	85	0	1	0	85	500	0.4	51	
	Steel Bending Machine	80	79	1	1	0	80	500	0.5	47	
	Water Bowzer	80	75	5	1	0	80	500	0.2	43	
	Fuel Pump	82	80	2	1	0	82	500	0.4	48	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	Power Generator	82	80	2	1	0	82	500	0.4	48	
	Welding Plant (Diesel)	72	70	2	1	0	72	500	0.4	38	
	Dewatering Pump (Diesel)	77	73	4	1	0	77	500	0.5	44	
	Dewatering Pump (Petrol)	77	72	5	1	0	77	500	0.5	44	
	Trailer	84	78	6	1	0	84	500	0.6	51	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 650 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	650	0.4	46	60.4
	Concrete Pump Mobile	82	76	6	1	0	82	650	0.4	45	
	Concrete Static Pump	82	79	3	1	0	82	650	0.4	45	
	Transit Mixture	85	80	5	1	0	85	650	0.4	48	
	Loader	85	82	3	1	0	85	650	0.4	48	
	Grader	85	83	2	1	0	85	650	0.6	50	
	Excavator (Type)	85	84	1	1	0	85	650	0.5	49	
	Excavator (Chain)	85	85	0	1	0	85	650	0.3	47	
	Dumper	80	75	5	1	0	80	650	0.4	43	
	Mobile Crain	85	83	2	1	0	85	650	0.2	45	
	Truck Crain	85	83	2	1	0	85	650	0.2	45	
	Mate Compactor	80	80	0	1	0	80	650	0.5	44	
	Mini Roller (MRL)	85	78	7	1	0	85	650	0.2	45	
	Mini Truck	55	54	1	1	0	55	650	0.4	18	
	Tractor	84	80	4	1	0	84	650	0.4	47	
	Tractor Trolley	84	79	5	1	0	84	650	0.4	47	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	650	0.3	47	
	Steel Cutting Machine	85	85	0	1	0	85	650	0.4	48	
	Steel Bending Machine	80	79	1	1	0	80	650	0.5	44	
	Water Bowzer	80	75	5	1	0	80	650	0.2	40	
	Fuel Pump	82	80	2	1	0	82	650	0.4	45	
	Power Generator	82	80	2	1	0	82	650	0.4	45	
	Welding Plant (Diesel)	72	70	2	1	0	72	650	0.4	35	
	Dewatering Pump	77	73	4	1	0	77	650	0.5	41	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	650	0.5	41	
	Trailer	84	78	6	1	0	84	650	0.6	49	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 750 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	750	0.4	45	59.2
	Concrete Pump Mobile	82	76	6	1	0	82	750	0.4	44	
	Concrete Static Pump	82	79	3	1	0	82	750	0.4	44	
	Transit Mixture	85	80	5	1	0	85	750	0.4	47	
	Loader	85	82	3	1	0	85	750	0.4	47	
	Grader	85	83	2	1	0	85	750	0.6	49	
	Excavator (Type)	85	84	1	1	0	85	750	0.5	48	
	Excavator (Chain)	85	85	0	1	0	85	750	0.3	46	
	Dumper	80	75	5	1	0	80	750	0.4	42	
	Mobile Crain	85	83	2	1	0	85	750	0.2	44	
	Truck Crain	85	83	2	1	0	85	750	0.2	44	
	Mate Compactor	80	80	0	1	0	80	750	0.5	43	
	Mini Roller (MRL)	85	78	7	1	0	85	750	0.2	44	
	Mini Truck	55	54	1	1	0	55	750	0.4	17	
	Tractor	84	80	4	1	0	84	750	0.4	46	
	Tractor Trolley	84	79	5	1	0	84	750	0.4	46	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	750	0.3	46	
	Steel Cutting Machine	85	85	0	1	0	85	750	0.4	47	
	Steel Bending Machine	80	79	1	1	0	80	750	0.5	43	
	Water Bowzer	80	75	5	1	0	80	750	0.2	39	
	Fuel Pump	82	80	2	1	0	82	750	0.4	44	
	Power Generator	82	80	2	1	0	82	750	0.4	44	
	Welding Plant (Diesel)	72	70	2	1	0	72	750	0.4	34	
	Dewatering Pump	77	73	4	1	0	77	750	0.5	40	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	(Diesel)										
	Dewatering Pump (Petrol)	77	72	5	1	0	77	750	0.5	40	
	Trailer	84	78	6	1	0	84	750	0.6	48	

Predicted Noise Level for Sensitive Receptions at Approximate Distance of 1,200 m

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
Site Clearing earth work, Loading, Unloading, Leveling, Compaction, Finishing etc.	Concrete Batching Plant	83	78	5	1	0	83	1,200	0.4	41	55.1
	Concrete Pump Mobile	82	76	6	1	0	82	1,200	0.4	40	
	Concrete Static Pump	82	79	3	1	0	82	1,200	0.4	40	
	Transit Mixture	85	80	5	1	0	85	1,200	0.4	43	
	Loader	85	82	3	1	0	85	1,200	0.4	43	
	Grader	85	83	2	1	0	85	1,200	0.6	45	
	Excavator (Type)	85	84	1	1	0	85	1,200	0.5	44	
	Excavator (Chain)	85	85	0	1	0	85	1,200	0.3	42	
	Dumper	80	75	5	1	0	80	1,200	0.4	38	
	Mobile Crain	85	83	2	1	0	85	1,200	0.2	40	
	Truck Crain	85	83	2	1	0	85	1,200	0.2	40	
	Mate Compactor	80	80	0	1	0	80	1,200	0.5	39	
	Mini Roller (MRL)	85	78	7	1	0	85	1,200	0.2	40	
	Mini Truck	55	54	1	1	0	55	1,200	0.4	13	
	Tractor	84	80	4	1	0	84	1,200	0.4	42	
	Tractor Trolley	84	79	5	1	0	84	1,200	0.4	42	
	Electric Vibrator (Petrol)	85	84	1	1	0	85	1,200	0.3	42	
	Steel Cutting Machine	85	85	0	1	0	85	1,200	0.4	43	
	Steel Bending Machine	80	79	1	1	0	80	1,200	0.5	39	
	Water Bowzer	80	75	5	1	0	80	1,200	0.2	35	
	Fuel Pump	82	80	2	1	0	82	1,200	0.4	40	

Activity	Source	Typical Peak Sound Level in Work Cycle (Lm)	Typical Minimum Sound Level in Work Cycle (Lb)	Lm-Lb	Fraction of Time Spent at Peak in Work Cycle (Ta/T)	Equivalency Factor (Ef)	Noise Level Emissions Leq(h)=E.L=Lj+EF	Estimated Distance from Equipment to Observer (D) E	Usage Factor (UF)	Equipment Leq(h) at Receptor dB(A) Leq(h)	Leq(h) Site at Receptor dB(A)
	Power Generator	82	80	2	1	0	82	1,200	0.4	40	
	Welding Plant (Diesel)	72	70	2	1	0	72	1,200	0.4	30	
	Dewatering Pump (Diesel)	77	73	4	1	0	77	1,200	0.5	36	
	Dewatering Pump (Petrol)	77	72	5	1	0	77	1,200	0.5	36	
	Trailer	84	78	6	1	0	84	1,200	0.6	44	

Appendix XVI: Emergency Response Plan for Breach of Canal Bank

Appendix XVI: Emergency Response Plan for Breach of Canal Bank

Flood-fighting measures are emergency measure deployed in the event when flood protection / control structures and flood proofing measures have failed or rendered ineffective with a sole objective of mitigating flood impacts

Reasons of Flooding:

- Failure of dykes, flood walls and embankments;
- Reduced capacity of river channels, flood ways, and flood bypass channels;
- Failure of weirs and barrages with consequent devastating flood waves;
- Failure of land drainage systems causing flooding of agriculture land; and
- Failure of urban drainage systems causing flooding within protected urban area.

Emergency Responses for flood-fighting in a typical case of failure of flood protection / control structures include the following:

- Closing of gaps in flood walls by sand bags or other available methods;
- Protection of river banks by sand bags, stone, or other available methods;
- Counteracting piping which is the main cause of collapse of embankment and dykes etc.;
- Protection of bridge piers, weirs, barrages and dams against erosion by rockfill, sand bags and other available methods;
- Construction of temporary non-structural protection measures to prevent the propagation of flood on non-protected land;
- Cutting of embankment, dykes etc. in order to allow flooding of less important areas, and thus to save other more important areas;
- Removing obstacles from active or potential flood ways, relief and flood bypass channels; and
- Protection of structures exposed to strong wind wash action.

Appendix XVII: ADB's Prohibited Investment Activities List

PROHIBITED INVESTMENT ACTIVITIES LIST

The following do not qualify for Asian Development Bank financing:

(i) production or activities involving harmful or exploitative forms of forced labor[1] or child labor;[2]
(ii) production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phaseouts or bans, such as (a) pharmaceuticals,[3] pesticides, and herbicides,[4] (b) ozone-depleting substances,[5] (c) polychlorinated biphenyls[6] and other hazardous chemicals,[7] (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,[8] and (e) transboundary trade in waste or waste products;[9]
(iii) production of or trade in weapons and munitions, including paramilitary materials;
(iv) production of or trade in alcoholic beverages, excluding beer and wine;[10]
(v) production of or trade in tobacco;[10]
(vi) gambling, casinos, and equivalent enterprises; [10]
(vii) production of or trade in radioactive materials,[11] including nuclear reactors and components thereof;
(viii) production of, trade in, or use of unbonded asbestos fibers;[12]
(ix) commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests;
(x) marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats;
(xi) real estate investment, if non-owner occupied, or property acquisition;
(xii) commercial real estate construction unless SME owner-occupied
(xiii) heavy construction material-related sectors;
(xiv) multi-family housing construction;
(xv) all mining, mineral processing and extraction activities;
(xvi) businesses involved with oil or energy import;
(xvii) businesses involved primarily with the import of luxury items;
(xviii) SMEs that are subsidiaries of or controlled by large enterprises; and
(xix) wastewater treatment activities.
(xx) water supply activities.

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[1] Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.
[2] Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org).
[3] A list of pharmaceutical products subject to phaseouts or bans is available at http://www.who.int.
[4] A list of pesticides and herbicides subject to phaseouts or bans is available at http://www.pic.int.
[5] A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phaseout dates. Information is available at http://www.unep.org/ozone/montreal.shtml.
[6] A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.
[7] A list of hazardous chemicals is available at http://www.pic.int.
[8] A list is available at http://www.cites.org.
[9] As defined by the Basel Convention; see http://www.basel.int.
[10] This does not apply to project sponsors who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to a project sponsor's primary operations.
[11] This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.
[12] This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

Appendix XVIII: WHO List of Restricted Pesticides

Appendix-XVIII: WHO List of Restricted Pesticides

Table 1. Extremely Hazardous (Class Ia) Technical grade Active Ingredients in Pesticides

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Aldicarb [ISO]	116-06-3	2757	C	S	I-S	1	0.93	DS 53; EHC 121; HSG 64; IARC 53; ICSC 94; JMPR 1993, 1996a
Brodifacoum [ISO]	56073-10-0	3027	CO	S	R	1	0.3	DS 57; EHC 175; HSG 93
Bromadiolone [ISO]	28772-56-7	3027	CO	S	R	1	1.12	DS 88; EHC 175; HSG 94
Bromethalin [ISO]	63333-35-7	2588		S	R	1	2	
Calcium cyanide [C]	592-01-8	1575		S	FM	2	39	Adjusted classification; see note 1; ICSC 407
Captafol [ISO]	2425-06-1			S	F	5	5000	Adjusted classification; see note 2; HSG 49; IARC 53; ICSC 119; JMPR 1978, 1986a; see note 3
Chlorethoxyfos [ISO]	54593-83-8	3018	OP	L	I	1	1.8	Extremely hazardous by skin contact (D = 12.5 mg/kg); *ICSC 1681*
Chlormephos [ISO]	24934-91-6	3018	OP	L	I	2	7	*ICSC 1682*
Chlorophacinone [ISO]	3691-35-8	2588		S	R	1	3.1	DS 62; EHC 175
Difenacoum [ISO]	56073-07-5	3027	CO	S	R	1	1.8	EHC 175; HSG 95
Difethialone [ISO]	104653-34-1	2588		S	R	1	0.56	EHC 175
Diphacinone [ISO]	82-66-6	2588		S	R	1	2.3	EHC 175
Disulfoton [ISO]	298-04-4	3018	OP	L	I	1	2.6	DS 68; JMPR 1992, 1997a; *ICSC 1408*
EPN	2104-64-5	2783	OP	S	I	2	14	See note 4; ICSC 753
Ethoprophos [ISO]	13194-48-4	3018	OP	L	I-S	2	D26	DS 70; JMPR 2000; *ICSC 1660*; *[Oral LD = 33 mg/kg]*
Flocoumafen	90035-08-8	3027		S	R	1	0.25	EHC 175; ICSC 1267
Hexachlorobenzene [ISO]	118-74-1	2729	OC	S	FST	5	D10000	Adjusted classification (notes 3 and 5); IARC 79; ICSC 895; *EHC 195*
Mercuric chloride [ISO]	7487-94-7	1624	HG	S	F-S	1	1	See note 3; ICSC 979
Mevinphos [ISO]	26718-65-0	3018	OP	L	I	1	D4	DS 14; ICSC 924; JMPR 1998b; *[Oral LD = 3.7 mg/kg]*
Parathion [ISO]	56-38-2	3018	OP	L	I	2	13	See note 3; DS 6; HSG 74; IARC 30, Suppl. 7; ICSC 6; JMPR 1996b
Parathion-methyl [ISO]	298-00-0	3018	OP	L	I	2	14	See note 3; DS 7; EHC 145; HSG 75; ICSC 626; JMPR 1985c, 1996b

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Phenylmercury acetate [ISO]	62-38-4	1674	HG	S	FST	2	24	Adjusted classification; see notes 3 and 6; ICSC 540
Phorate [ISO]	298-02-2	3018	OP	L	I	1	2	DS 75; JMPR 1997b, 2005; *ICSC 1060*
Phosphamidon	13171-21-6	3018	OP	L	I	2	7	See note 3; DS 74; ICSC 189; JMPR 1987b
Sodium fluoroacetate [C]	62-74-8	2629		S	R	1	0.2	DS 16; *ICSC 484*
Sulfotep [ISO]	3689-24-5	1704	OP	L	I	1	5	ICSC 985
Tebupirimfos [ISO*]	96182-53-5	3018	OP	L	I	1	1.3	Extremely hazardous by skin contact (LD 9.4 mg/kg in rats)
Terbufos [ISO]	13071-79-9	3018	OP	L	I-S	1	c2	JMPR 1991, 2004

EHC = Environmental Health Criteria Monograph; DS = Pesticide Data Sheet; HSG = Health and Safety Guide; IARC = IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; ICSC = International Chemical Safety Card; JMPR = Evaluation by the Joint FAO/WHO Meeting on Pesticide Residues.

Notes to Class Ia

1. Calcium cyanide is in Class Ia as it reacts with moisture to produce hydrogen cyanide gas. The gas is not classified under the WHO system (see Table 8).
2. Captafol is carcinogenic in both rats and mice.
3. The international trade of captafol, hexachlorobenzene, mercury compounds, parathion, parathion-methyl, and phosphamidon is regulated by the Rotterdam convention on Prior Informed Consent (see http://www**Error! Hyperlink reference not valid.**
4. EPN has been reported as causing delayed neurotoxicity in hens.
5. Hexachlorobenzene has caused a serious outbreak of porphyria in humans. The use and production of hexachlorobenzene is severely restricted by the Stockholm convention on persistent organic pollutants, which entered into force on 17 May, 2004. See http://www**Error! Hyperlink reference not valid.**
6. Phenylmercury acetate is highly toxic to mammals and very small doses have produced renal lesions: teratogenic in the rat.

THE FINAL CLASSIFICATION OF ANY PRODUCT DEPENDS ON ITS FORMULATION

See Pages 7 & 8, and the Appendix

Table 2. Highly hazardous (Class Ib) technical grade active ingredients in pesticides

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Acrolein [C]	107-02-8	1092		L	H	2	29	EHC 127; HSG 67; IARC 63; ICSC 90
Allyl alcohol [C]	107-18-6	1098		L	H	3	64	Highly irritant to skin and eyes; ICSC 95; *Adjusted classification (see note 3)*
Azinphos-ethyl [ISO]	2642-71-9	2783	OP	S	I	2	12	DS 72; JMPR 1974
Azinphos-methyl [ISO]	86-50-0	2783	OP	S	I	2	16	DS 59; ICSC 826; JMPR 1992*, 2009b*
Blasticidin-S	2079-00-7	2588		S	F	2	16	
Butocarboxim [ISO]	34681-10-2	2992	C	L	I	3	158	JMPR 1986a; *Adjusted classification (see note 3)*
Butoxycarboxim [ISO]	34681-23-7	2992	C	L	I	3	D288	*Adjusted classification (see note 3)*
Cadusafos [ISO]	95465-99-9	3018	OP	L	N,I	2	37	JMPR 1992
Calcium arsenate [C]	7778-44-1	1573	AS	S	I	2	20	EHC 18, 224; IARC 84; ICSC 765; JMPR 1969
Carbofuran [ISO]	1563-66-2	2757	C	S	I	2	8	DS 56; ICSC 122; JMPR 1997b, 2003b*, 2009a; See note 2.*
Chlorfenvinphos [ISO]	470-90-6	3018	OP	L	I	2	31	ICSC 1305; JMPR 1995b
3-Chloro-1,2-propanediol [C]	96-24-2	2689		L	R	3	112	*Adjusted classification (see notes 1 and 3)*
Coumaphos [ISO]	56-72-4	2783	OP	S	AC,MT	2	7.1	ICSC 422; JMPR 1991
Coumatetralyl [ISO]	5836-29-3	3027	CO	S	R	2	16	
Cyfluthrin [ISO]	*68359-37-5*		*PY*	*S*	*I*	*2*	*c15*	*JMPR 2008; See note 9, p. 8*
Beta-cyfluthrin [ISO]	*68359-37-5*		*PY*	*S*	*I*	*2*	*c11*	*JMPR 2008; See note 9, p. 8*
Zeta-cypermethrin [ISO]	52315-07-8	3352	PY	L	I	3	c86	See note 9, p. 8; HSG 22; ICSC 246; *JMPR 2008; Adjusted classification (see note 3)*
Demeton-S-methyl [ISO]	919-86-8	3018	OP	L	I	2	40	DS 61, EHC 197; ICSC 705; JMPR 1990
Dichlorvos [ISO]	62-73-7	3018	OP	L	I	3	56	Volatile, DS 2; EHC 79; HSG 18; IARC 20, 53; ICSC 690; JMPR 1994; *Adjusted classification (see note 3)*
Dicrotophos [ISO]	141-66-2	3018	OP	L	I	2	22	ICSC 872
Dinoterb [ISO]	1420-07-1	2779	NP	S	H	2	25	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
DNOC [ISO]	534-52-1	2779	NP	S	I-S,H	2	25	JMPR 1965a; EHC 220; *ICSC 462*. See note 2.
Edifenphos [ISO]	17109-49-8	3018	OP	L	F	3	150	JMPR 1982. *Adjusted classification (see note 3)*
Ethiofencarb [ISO]	29973-13-5	2992	C	L	I	3	200	JMPR 1983. *Adjusted classification (see note 3)*
Famphur	52-85-7	2783	OP	S	I	2	48	
Fenamiphos [ISO]	22224-92-6	2783	OP	S	N	2	15	DS 92; ICSC 483; JMPR 1998b, 2003b
Flucythrinate [ISO]	70124-77-5	3352	PY	L	I	3	c67	JMPR 1986b; see note 9, p.8; *Adjusted classification (see note 3)*
Fluoroacetamide [C]	640-19-7	2588		S	R	2	13	*ICSC 1434.* See note 2
Formetanate [ISO]	22259-30-9	2757	C	S	AC	2	21	
Furathiocarb	65907-30-4	2992	C	L	I-S	2	42	
Heptenophos [ISO]	23560-59-0	3018	OP	L	I	3	96	*Adjusted classification (see note 3)*
Isoxathion [ISO]	18854-04-8	3018	OP	L	I	3	112	*Adjusted classification (see note 3)*
Lead arsenate [C]	7784-40-9	1617	AS	S	L	2	c10	*EHC 18*, 224; IARC 84; ICSC 911; JMPR 1969
Mecarbam [ISO]	2595-54-2	3018	OP	Oil	I	2	36	JMPR 1987a
Mercuric oxide [ISO]	21908-53-2	1641	HG	S	O	2	18	ICSC 981; CICAD 50. See note 2
Methamidophos [ISO]	10265-92-6	2783	OP	S	I	2	30	HSG 79; ICSC 176; JMPR 1991, 2003b; See note 2
Methidathion [ISO]	950-37-8	3018	OP	L	I	2	25	JMPR 1998b; *ICSC 1659*
Methiocarb [ISO]	2032-65-7	2757	C	S	I	2	20	JMPR 1999
Methomyl [ISO]	16752-77-5	2757	C	S	I	2	17	DS 55, EHC 178; HSG 97; ICSC 177, JMPR 1989, 2002
Monocrotophos [ISO]	6923-22-4	2783	OP	S	I	2	14	See note 2; HSG 80; ICSC 181; JMPR 1996b
Nicotine [ISO]	54-11-5	1654		L		1	D50	ICSC 519
Omethoate [ISO]	1113-02-6	3018	OP	L	I	2	50	JMPR 1997a
Oxamyl [ISO]	23135-22-0	2757	C	S	I	2	6	DS 54; JMPR 1986b, 2003b
Oxydemeton-methyl [ISO]	301-12-2	3018	OP	L	I	3	65	JMPR 1990, 2003b; *Adjusted classification (see note 3)*
Paris green [C]	12002-03-8	1585	AS	S	L	2	22	Copper-arsenic complex
Pentachlorophenol [ISO]	87-86-5	3155		S	I,F,H	2	D80	See note 2; Irritant to skin; EHC 71; HSG 19; IARC 20, 53; ICSC 69

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Propetamphos [ISO]	31218-83-4	3018	OP	L	I	3	106	*Adjusted classification (see note 3)*
Sodium arsenite [C]	7784-46-5	1557	AS	S	R	2	10	EHC 224; IARC 84; *ICSC 1603*
Sodium cyanide [C]	143-33-9	1689		S	R	2	6	ICSC 1118; CICAD 61
Strychnine [C]	57-24-9	1692		S	R	2	16	ICSC 197
Tefluthrin	79538-32-2	3349	PY	S	I-S	2	c22	See note 9, p. 8
Thallium sulfate [C]	7446-18-6	1707		S	R	2	11	DS 10, EHC 182; ICSC 336
Thiofanox [ISO]	39196-18-4	2757	C	S	I-S	2	8	
Thiometon [ISO]	640-15-3	3018	OP	Oil	I	3	120	DS 67; ICSC 580; JMPR 1980; *Adjusted classification (see note 3)*
Triazophos [ISO]	24017-47-8	3018	OP	L	I	3	82	JMPR 1994, 2003b; *Adjusted classification (see note 3)*
Vamidothion [ISO]	2275-23-2	3018	OP	L	I	3	103	JMPR 1989*; ICSC 758; Adjusted classification (see note 3)*
Warfarin [ISO]	81-81-2	3027	CO	S	R	2	10	DS 35, EHC 175; HSG 96; ICSC 821
Zinc phosphide [C]	1314-84-7	1714		S	R	2	45	DS 24, EHC 73; ICSC 602

EHC = Environmental Health Criteria Monograph; DS= Pesticide Data Sheet; HSG = Health and Safety Guide; IARC = IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; ICSC = International Chemical Safety Card; JMPR = Evaluation by the Joint FAO/WHO Meeting on Pesticide Residues.

Notes to Class Ib

1. 3-Chloro-1,2-propanediol in nonlethal dosage is a sterilant for male rats. This compound is also known as alpha chlorhydrin.
2. The international trade of carbofuran, DNOC, fluoroacetamide, mercury compounds, methamidophos, monocrotophos and pentachlorophenol is regulated by the Rotterdam convention on Prior Informed Consent (see http://www**Error! Hyperlink reference not valid.**
3. As a precautionary measure, the classification of certain liquid pesticides has been adjusted to avoid those pesticides being assigned to a less hazardous Class in the process of aligning the WHO Classification with the GHS. Details of how the WHO Classification has been aligned with the GHS Acute Toxicity Hazard Categories are described in the introductory notes for Part II.

THE FINAL CLASSIFICATION OF ANY PRODUCT
DEPENDS ON ITS FORMULATION
See Pages 7 & 8, and the Appendix

Table 3. Moderately Hazardous (Class II) Technical Trade Active Ingredients in Pesticides

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Acephate [ISO]	30560-19-1		OP	S	I	4	945	JMPR 1991, 2003b, *2006b; ICSC 748*
Acifluorfen [ISO]	50594-66-6			S	H	4	1370	Strong irritant to eyes
Alachlor [ISO]	15972-60-8	2588		S	H	4	930	See note 1; DS 86; IARC 19, 36, 63; ICSC 371
Alanycarb [ISO]	83130-01-2		C	S	I	4	330	
Allethrin [ISO]	584-79-2		PY	Oil	I	4	c685	See note 9, page 8; EHC 87; HSG 24; ICSC 212; JMPR 1965a
Ametryn [ISO]	834-12-8		T	S	H	4	110	
Amitraz [ISO]	33089-61-1			S	AC	4	800	ICSC 98; JMPR 1999
Anilofos [ISO]	64249-01-0		OP	S	H	4	472	
Azaconazole	60207-31-0			S	F	4	308	
Azamethiphos [ISO]	35575-96-3		OP	S	I	4	1010	
Azocyclotin [ISO]	41083-11-8	2786	OT	S	AC	3	80	JMPR 1990, 1995b, *2006b*
Bendiocarb [ISO]	22781-23-3	2757	C	S	I	3	55	DS 52
Benfuracarb [ISO]	82560-54-1	2992	C	L	I	3	205	
Bensulide [ISO]	741-58-2	2902		L	H	3	270	ICSC 383
Bensultap [ISO]	17606-31-4			S	I	4	1100	
Bentazone [ISO]	25057-89-0			S	H	4	1100	HSG 48; ICSC 828; JMPR 1999, 2005
Bifenthrin	82657-04-3	3349	PY	S	I	3	c55	JMPR 1993
Bilanafos [ISO]	71048-99-2			S	H	3	268	
Bioallethrin [C]	584-79-2		PY	L	I	4	c700	See note 2; note 9, p. 8; ICSC 227
Bromoxynil [ISO]	1689-84-5	2588		S	H	3	190	
Bromuconazole	116255-48-2			S	F	4	365	ICSC 1264
Bronopol	52-51-7			S	B	3	254	ICSC 415
Butamifos [ISO]	36335-67-8		OP	L	H	4	630	
Butralin [ISO]	33629-47-9			S	H	4	1049	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Butroxydim [ISO]	138164-12-2			S	H	4	1635	
Butylamine [ISO]	13952-84-6	1992		L	F	4	380	Irritant to skin; ICSC 401; JMPR 1982, 1985b
Carbaryl [ISO]	63-25-2	2757	C	S	I	3	c300	DS 3; EHC 153; HSG 78; IARC 12, Suppl.7; ICSC 121; JMPR
Carbosulfan [ISO]	55285-14-8	2992	C	L	I	3	250	JMPR 1987a, 2004
Cartap [ISO]	15263-53-3			S	I	4	325	EHC 76; JMPR 1996a
Chloralose [C]	15879-93-3			S	R	4	400	
Chlordane [ISO]	57-74-9	2996	OC	L	I	4	460	See notes 3 and 4; DS 36; EHC 34; HSG 13; IARC 79; ICSC 740; JMPR 1995a
Chlorfenapyr [ISO]	122453-73-0			S	I,MT	4	441	
Chlormequat (chloride) [ISO]	999-81-5			S	PGR	4	670	ICSC 781; JMPR 2000
Chloroacetic acid [C]	79-11-8	1751		S	H	4	650	Irritant to skin and eyes; data refer to sodium salt; ICSC 235
Chlorphonium chloride [ISO]	115-78-6	2588		S	PGR	3	178	Irritant to skin and eyes
Chlorpyrifos [ISO]	2921-88-2	2783	OP	S	I	3	135	DS 18; ICSC 851; JMPR 2000
Clomazone [ISO]	81777-89-1			L	H	4	1369	
Copper hydroxide [C]	20427-59-2		CU	S	F	4	1000	
Copper oxychloride [C]	1332-40-7		CU	S	F	4	1440	
Copper sulfate [C]	7758-98-7		CU	S	F	3	300	*ICSC 751*
4-CPA [ISO]	122-88-3		PAA	S	PGR	4	850	
Cuprous oxide [C]	1317-39-1		CU	S	F	4	470	ICSC 421, EHC 200
Cyanazine [ISO]	21725-46-2		T	S	H	3	288	ICSC 391
Cyanophos [ISO]	2636-26-2		OP	L	I	4	610	
Cyhalothrin [ISO]	68085-85-8	3352	PY	Oil	Ix	3	c144	See note 9, p. 8; EHC 99; HSG 38; ICSC 858; JMPR 1985c; JECFA 2000b
Cyhexatin [ISO]	13121-70-5		OT	S	AC	3	*265*	EHC 15; JMPR 1995b, *2006b*
Cymoxanil [ISO]	57966-95-7			S	F	4	1196	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Cypermethrin [ISO]	52315-07-8	3352	PY	L	I	3	c250	See note 9, p. 8; DS 58; EHC 82; HSG 22; ICSC 246; JECFA 1996
Alpha-cypermethrin [ISO]	67375-30-8	3349	PY	S	I	3	c79	See note 9, p 8; EHC 142; JECFA 1996; *JMPR 2008*
Cyphenothrin [(1R)-isomers] [ISO]	39515-40-7	3352	PY	L	I	4	318	
Cyproconazole	94361-06-5			S	F	4	1020	
2,4-D [ISO]	94-75-7	3345	PAA	S	H	4	375	DS 37; EHC 29, 84; HSG 5; IARC 41, Suppl. 7; ICSC 33; JMPR
Dazomet [ISO]	533-74-4			S	F-S	4	640	Irritant to skin and eyes; ICSC 786
2,4-DB	94-82-6			S	H	4	700	
DDT [ISO]	50-29-3	2761	OC	S	I	3	113	See notes 3 and 4; DS 21; EHC 9, 83; IARC 53; ICSC 34; JMPR
Deltamethrin [ISO]	52918-63-5	3349	PY	S	I	3	c135	See note 9, p. 8; DS 50; EHC 97; HSG 30; IARC 53; ICSC 247; JMPR 2001
Diazinon [ISO]	333-41-5	3018	OP	L	I	4	*300*	DS 45, EHC 198; ICSC 137; JMPR 1994, 2002, *2008*
Dicamba [ISO]	1918-00-9			S	H	4	1707	ICSC 139
Dichlorobenzene [C]	106-46-7			S	FM	4	500-5000	Mixture of isomers: ortho (3) 95-50-1, meta (3) 541-73-1, para (2B)
Dichlorophen [ISO]	97-23-4		OC	S	F	4	1250	
Dichlorprop [ISO]	7547-66-2			S	H	4	800	ICSC 38
Diclofop [ISO]	40483-25-2			S	H	4	565	
Dicofol [ISO]	115-32-2		OC	S	AC	4	c690	DS 81; IARC 30; ICSC 752; JMPR 1993
Difenoconazole [ISO]	119446-68-3			S	F	4	1453	*JMPR 2009b*
Difenzoquat [ISO]	43222-48-6	2588		S	H	4	470	
Dimepiperate [ISO]	61432-55-1		TC	S	H	4	946	
Dimethachlor [ISO]	50563-36-5			S	H	4	1600	
Dimethipin [ISO]	55290-64-7			S	H	4	1180	JMPR 2000, 2005

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD$_{50}$ mg/kg	Remarks
Dimethenamid [ISO]	*87674-68-8*			*L*	*H*	*4*		
Dimethylarsinic acid [C]	75-60-5	1572	AS	S	H	4	1350	
Dimethoate [ISO]	60-51-5	2783	OP	S	I	3	c150	DS 42; EHC 90; HSG 20; ICSC 741; JMPR 1997b, 2004
Diniconazole [ISO]	83657-24-3			S	F	4	639	
Dinobuton [ISO]	973-21-7	2779	NP	S	AC,F	3	140	
Dinocap [ISO]	39300-45-3		NP	S	AC,F	4	980	ICSC 881; JMPR 1999
Diphenamid [ISO]	957-51-7			S	H	4	970	ICSC 763
Diquat [ISO]	2764-72-9	2781	BP	S	H	3	231	Irritant to skin and eyes and damages nails; DS 40; EHC 39; HSG
Dithianon [ISO]	3347-22-6			S	F	4	640	JMPR 1993
Dodine [ISO]	2439-10-3			S	F	4	1000	JMPR 2001
Endosulfan [ISO]	115-29-7	2761	OC	S	I	3	80	DS 15; EHC 40; HSG 17; ICSC 742; JMPR 1999
Endothal-sodium [(ISO)]	125-67-9	2588		S	H	3	51	
EPTC [ISO]	759-94-4		TC	L	H	4	1652	ICSC 469
Esfenvalerate [ISO]	66230-04-4	3349	PY	S	I	3	87	JMPR 2003b; *ICSC 1516*
Ethion [ISO]	563-12-2	3018	OP	L	I	3	208	ICSC 888; JMPR 1991
Fenazaquin [ISO]	120928-09-8	2588		S	AC	3	134	
Fenitrothion [ISO]	122-14-5		OP	L	I	4	503	DS 30; EHC 133; HSG 65; ICSC 622; JMPR 2001
Fenobucarb	3766-81-2		C	S	I	4	620	
Fenothiocarb [ISO]	62850-32-2		C	S	L	4	1150	
Fenpropidin [ISO]	67306-00-7			L	F	4	1440	
Fenpropathrin [ISO]	64257-84-7	3349	PY	S	I	3	c66	See note 9, p. 8; JMPR 1994
Fenpyroximate [ISO]	*134098-61-6*			*S*	*AC*	*3*	*245*	*Highly toxic by inhalation (LC = 0.21-0.36 mg/l); JMPR 2007*
Fenthion [ISO]	55-38-9	3018	OP	L	I,L	3	D586	DS 23; ICSC 655; JMPR 1998b
Fentin acetate[(ISO)]	900-95-8	2786	OT	S	F	3	125	DS 22; EHC 15; JMPR 1992; CICAD 13

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD $_{50}$ mg/kg	Remarks
Fentin hydroxide[(ISO)]	76-87-9	2786	OT	S	F	3	108	DS 22; EHC 15; ICSC 1283; JMPR 1992; *CICAD 13*
Fenvalerate [ISO]	51630-58-1	3352	PY	L	I	4	c450	See note 9, p. 8; DS 90; EHC 95, HSG 34; IARC 53; ICSC 273; JMPR 1986c
Ferimzone [ISO]	89269-64-7			S	F	4	725	
Fipronil	120068-37-3	2588		S	I	3	92	JMPR 1998b, 2001; *ICSC 1503*
Fluchloralin [ISO]	33245-39-5			S	H	4	1550	
Flufenacet [ISO]	142459-58-3			S	H	4	600	May cause skin sensitization
Fluoroglycofen	77501-60-1			S	H	4	1550	
Flurprimidol [ISO]	56425-91-3			S	PGR	4	709	
Flusilazole	85509-19-9			S	F	4	*672*	JMPR 1996b, *2009b*
Flutriafol [ISO]	76674-21-0			S	F,FST	4	1140	
Fluxofenim [ISO]	88485-37-4			oil	H	4	670	
Fomesafen [ISO]	72178-02-0		OC	S	H	4	1250	
Fuberidazole [ISO]	3878-19-1			S	F	4	336	
Furalaxyl [ISO]	57646-30-7			S	F	4	940	
Gamma-HCH [ISO], Lindane	58-89-9	2761	OC	S	I	3	88	*ICSC 53*; JMPR 2003b; See note 3
Glufosinate [ISO]	53369-07-6			S	H	4	1625	JMPR 2000
Guazatine	108173-90-6			S	FST	3	230	LD $_{50}$ value refers to triacetate; JMPR 1998b
Haloxyfop	69806-34-4			S	H	4	*300*	JMPR 1996b, *2008 (includes Haloxyfop-R and esters)*
HCH [ISO]	608-73-1	2761	OC	S	I	3	100	See notes 3, 4 and 5; EHC 123; IARC 5, 20, 42; ICSC 487; JMPR
Hexazinone [ISO]	51235-04-2			S	H	4	1690	
Hydramethylnon	67485-29-4			S	I	4	1200	
Imazalil [ISO]	35554-44-0	2588		S	F	3	*227*	ICSC 1303; JMPR 2001, 2002, *2006b*
Imidacloprid [ISO]	138261-41-3			S	I	4	450	JMPR 2002; *ICSC 1501*

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Iminoctadine [ISO]	13516-27-3			S	F	3	300	Eye irritant
Indoxacarb [ISO]	*173584-44-6*			*S*	*I*	*3*	*268*	*JMPR 2006b; LD applies to 3:1 mixture of isomers in commercial use*
Ioxynil [ISO]	1689-83-4	2588		S	H	3	110	ICSC 900
Ioxynil octanoate [(ISO)]	3861-47-0			S	H	4	390	
Iprobenfos	26087-47-8			S	F	4	600	
Isoprocarb [ISO]	2631-40-5	2757	C	S	I	4	403	
Isoprothiolane [ISO]	50512-35-1			S	F	4	1190	
Isoproturon [ISO]	34123-59-6			S	H	4	1800	
Isouron [ISO]	55861-78-4			S	H	4	630	
Lambda-cyhalothrin	2164-08-1	3349	PY	S	I	3	c56	See note 9, p. 8; EHC 142; HSG 38; *JMPR 2009b; ICSC 859*
MCPA [ISO]	94-74-6		PAA	S	H	4	700	IARC 30, 41; ICSC 54
MCPA-thioethyl [ISO]	25319-90-8		PAA	S	H	4	790	
MCPB [ISO]	94-81-5			S	H	4	680	
Mecoprop [ISO]	7085-19-0			S	H	4	930	ICSC 55
Mecoprop-P [ISO]	16484-77-8			S	H	4	1050	
Mefluidide [ISO]	53780-34-0			S	H	4	1920	
Mepiquat [ISO]	15302-91-7			S	PGR	4	1490	
Mercurous chloride [C]	10112-91-1	2025	HG	S	F	3	210	See note 3; ICSC 984; *CICAD 50*
Metalaxyl [ISO]	57837-19-1			S	F	4	670	JMPR 1983, 2003b
Metaldehyde [ISO]	108-62-3			S	M	3	227	DS 93
Metamitron [ISO]	41394-05-2			S	H	4	1183	*ICSC 1361*
Metam-sodium [(ISO)]	137-42-8	2771		S	F-S	3	285	
Metconazole [ISO]	125116-23-6			S	F	4	660	
Methacrifos [ISO]	62610-77-9		OP	L	I	4	678	JMPR 1991

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Methasulfocarb [ISO]	66952-49-6	2757		S	F	3	112	
Methylarsonic acid [ISO]	124-58-3		AS	S	H	4	1800	ICSC 755; EHC 224
Methyl isothiocyanate [ISO]	556-61-6	2588		S	F-S	3	72	Skin and eye irritant; see note 6
Metolcarb [ISO]	1129-41-5		C	S	I	3	268	
Metribuzin [ISO]	21087-64-9			S	H	4	322	*ICSC 516*
Molinate [ISO]	2212-67-1		TC	L	H	4	720	
Myclobutanil	88671-89-0			S	F	4	1600	JMPR 1993
Nabam [ISO]	142-59-6	2771		S	F	4	395	Goitrogenic in rats
Naled [ISO]	300-76-5	3018	OP	L	I	4	430	DS 39; ICSC 925
2-Napthyloxyacetic acid [ISO]	120-23-0			S	PGR	4	600	
Nitrapyrin [ISO]	1929-82-4			S	B-S	4	1072	*ICSC 1658*
Nuarimol [ISO]	63284-71-9			S	F	4	1250	
Octhilinone [ISO]	26530-20-1			S	F	4	1470	
Oxadixyl	77732-09-3			S	F	4	1860	
Paclobutrazol [ISO]	76738-62-0			S	PGR	4	1300	JMPR 1989
Paraquat [ISO]	1910-42-5	2781	BP	S	H	3	150	See note 7; DS 4; EHC 39; HSG 51; ICSC 5; JMPR 1987a, 2004
Pebulate [ISO]	1114-71-2		TC	L	H	4	1120	
Pendimethalin [ISO]	40487-42-1			S	H	4	1050	
Permethrin [ISO]	52645-53-1	3352	PY	L	I	4	c500	See note 9, p. 8; DS 51; EHC 94; HSG 33; IARC 53; ICSC 312; JMPR 2000
Phenthoate [ISO]	2597-03-7	3018	OP	L	I	4	c400	DS 48; JMPR 1985c
Phosalone [ISO]	2310-17-0	2783	OP	S	I	3	120	ICSC 797; JMPR 1998b, 2002
Phosmet [ISO]	732-11-6	2783	OP	S	I,AC	3	113	ICSC 543; JMPR 1999, 2004
Phoxim [ISO]	14816-18-3		OP	L	I	4	D1975	DS 31; JECFA 2000a
Piperophos [ISO]	24151-93-7	3018	OP	oil	H	4	324	

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Pirimicarb [ISO]	23103-98-2	2757	C	S	AP	3	147	JMPR 1983, 2005
Pirimiphos-methyl [ISO]	29232-93-7		OP	L	I	4	*1667*	DS 49; JMPR 1993, *2008*
Prallethrin [ISO]	23031-36-9	3352	PY	oil	I	4	460	
Prochloraz [ISO]	67747-09-5			S	F	4	1600	JMPR 1985a
Profenofos [ISO]	41198-08-7	3018	OP	L	I	4	358	JMPR 1991, 2008
Propachlor [ISO]	1918-16-7			S	H	4	1500	DS 78; EHC 147; HSG 77; JMPR 2002
Propanil [ISO]	709-98-8			S	H	4	c1400	ICSC 552
Propiconazole [ISO]	60207-90-1			L	F	4	1520	JMPR 1988, 2005
Propoxur [ISO]	114-26-1	2757	C	S	I	3	95	DS 25; ICSC 191; JMPR 1990
Prosulfocarb [ISO]	52888-80-9		TC	L	H	4	1820	
Prothiofos [ISO]	34643-46-4		OP	L	I	4	925	
Pyraclofos [ISO]	77458-01-6	3018	OP	L	I	3	237	
Pyrazophos [ISO]	13457-18-6	2784		S	F	4	435	JMPR 1993
Pyrazoxyfen [ISO]	71561-11-0			S	H	4	1644	
Pyrethrins [C]	8003-34-7			L	I	4	500-1000	See note 8; DS 11; JMPR 2000, 2004; *ICSC 1475*
Pyridaben [ISO]	96489-71-3			S	AC	4	820	
Pyridaphenthion	119-12-0		OP	S	I	4	769	
Pyroquilon [ISO]	57369-32-1			S	F	4	320	
Quinalphos [ISO]	13593-03-8	2783	OP	S	I	3	62	
Quinoclamine [ISO]	2797-51-5			S	H	4	1360	
Quizalofop	76578-12-6			S	H	4	1670	
Quizalofop-p-tefuryl [ISO]	119738-06-6			L	H	4	1012	
Rotenone [C]	83-79-4	2588		S	I	3	132-1500	See note 9; HSG 73; ICSC 944
Simetryn [ISO]	1014-70-6		T	S	H	4	1830	
Sodium chlorate [ISO]	7775-09-9	1495		S	H	4	1200	ICSC 1117

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Spiroxamine [ISO]	118134-30-8			L	F	4	500	Dermal LD_{50} 1068 mg/kg; may cause skin sensitisation
Sulfluramid [ISO]	4151-50-2			S	I	4	543	
2,3,6-TBA [ISO]	50-31-7			S	H	4	1500	
TCA [ISO] (acid)	76-03-9	1839		S		4	400	See note 5 to Table 4, p. 38; ICSC 586
Tebuconazole [ISO]	107534-96-3			S	F	4	1700	JMPR 1995b
Tebufenpyrad [ISO]	119168-77-3			S	MT	4	595	
Tebuthiuron [ISO]	34014-18-1			S	H	4	644	
Terbumeton [ISO]	33693-04-8		T	S	H	4	483	
Tetraconazole [ISO]	112281-77-3			Oil	F	4	1031	
Thiacloprid	111988-49-9		S	I		4	*396*	*JMPR 2008*
Thiobencarb [ISO]	28249-77-6		TC	L	H	4	1300	
Thiocyclam [ISO]	31895-22-4			S	I	4	310	
Thiodicarb [ISO]	59669-26-0	2757	C	S	I	3	66	JMPR 2001
Thiram [ISO]	137-26-8			S	F	4	560	DS 71; EHC 78; IARC 12, 53; ICSC 757; JMPR 1993; See note 3
Tralkoxydim [ISO]	87820-88-0			S	H	4	934	
Tralomethrin	66841-25-6	3349	PY	S	I	3	c85	
Triadimefon [ISO]	43121-43-3			S	F	4	602	JMPR 1986b, 2005
Triadimenol [ISO]	55219-65-3			S	FST	4	900	JMPR 1990, 2005
Triazamate [ISO]	112143-82-5	2588		S	AP	3	50-100	
Trichlorfon [ISO]	52-68-6		OP	S	I	3	250	DS 27; EHC 132; HSG 66; IARC 30, Suppl 7; ICSC 585; JMPR 1979; JECFA 2000b, 2003
Triclopyr [ISO]	55335-06-3			S	H	4	710	
Tricyclazole [ISO]	41814-78-2			S	F	4	305	
Tridemorph [ISO]	81412-43-3			Oil	F	4	650	
Triflumizole	99387-89-0			S	F	4	695	ICSC 1252

Common name	CAS no	UN no	Chem type	Phys state	Main use	GHS	LD_{50} mg/kg	Remarks
Uniconazole [ISO]	83657-22-1			S	PGR	4	1790	
XMC	2655-14-3		C	S	I	4	542	
Xylylcarb	2425-10-7		C	S	I	4	380	
Ziram [ISO]	137-30-4			S	F	4	1400	Irritant to skin; DS 73; EHC 78; IARC 12, 53; ICSC 348; JMPR 1997b

EHC = Environmental Health Criteria Monograph; DS= Pesticide Data Sheet; HSG = Health and Safety Guide; IARC = IARC Monographs on the Evaluation of Carcinogenic Risks to Humans; ICSC = International Chemical Safety Card; JECFA = Evaluation by the Joint FAO/WHO Expert Committee on Food Additives; JMPR = Evaluation by the Joint FAO/WHO Meeting on Pesticide Residues.

Notes to Class II

1. Alachlor was previously classified as a Class Ia pesticide due to its carcinogenicity in rats. However mechanistic studies have indicated that tumors are induced by a mechanism not relevant to humans.
2. Bioallethrin, esbiothrin, esbiol, and esdepallèthrine are members of a series; their toxicity varies considerably within this series, according to concentrations of isomers.
3. The international trade of chlordane, DDT, Gamma-HCH (lindane), HCH, mercury compounds and thiram is regulated by the Rotterdam convention on Prior Informed Consent (see http://www.pic.int/), which entered into force on 24 February 2004. See Table 7, p. 51.
4. The production and use of chlordane, DDT, *Gamma-HCH (lindane) and HCH (specifically alpha-HCH and beta-HCH)* are strictly limited by the Stockholm convention on persistent organic pollutants, which entered into force on 17 May, 2004 *and has subsequently been amended*. See http://www.pops.int/.
5. HCH: The LD_{50} varies according to the mixture of isomers. The value shown has been chosen, and the technical product placed in Class II, as a result of the cumulative properties of the beta isomer.
6. The melting point of methyl isothiocyanate (S) is 35°C.
7. Paraquat has serious delayed effects if absorbed. It is of relatively low hazard in normal use but may be fatal if the concentrated product is taken by mouth or spread on the skin.
8. Mixture of compounds present in *Pyrethrum cinerariaefolium* and other flowers.
9. Compounds from roots of *Derris* and *Lonchocarpus* spp.

THE FINAL CLASSIFICATION OF ANY PRODUCT DEPENDS ON ITS FORMULATION
See Pages 7 & 8, and the Annex