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Report Name: National Standard Soil Environmental Quality Risk Control Standard for Soil Contamination of Agricultural Land

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Prepared By: FAS China Staff, Josh DeMoss

Approved By: Adam Branson

Report Highlights:

The National Standard Soil Environment Quality Risk Control Standard for Soil Contamination of Agricultural Land (Trial Edition) (GB15618-2018) was published jointly by the State Administration for Market Regulation (SAMR) and Ministry of Ecology and Environment of the People's Republic of China (PRC) on June 22, 2018 and it entered into force on August 1, 2018. The standard regulates the definitions, risk control limits, and supervision requirements for soil contamination of agricultural land. This report provides an unofficial translation of the published standard. Stakeholders should conduct their own review of the regulation. This report is being published and shared by FAS China now owing to its relevance to the recent WTO notification on Code of Practice for Prevention and Reduction of Lead Contamination in Foods.

BACKGROUND

On July 11, 2024, the PRC notified a new National Food Safety Standard for the Code of Practice for the Prevention and Reduction of Lead Contamination in Foods to the WTO under G/SPS/N/CHN/1312. This national standard was referenced in that notification. To view the notified draft, refer to FAS China GAIN report CH2024-0097. This National Standard for Soil Environment Quality Risk Control Standard for Soil Contamination of Agricultural Land (trial addition) may be relevant for numerous PRC standards and stakeholders are encouraged to undertake their own review of the material.

BEGIN UNOFFICIAL TRANSLATION

National Standard Soil Environmental Quality Risk Control Standard for Soil Contamination of Agricultural Land (Trial Edition)

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Preface

This standard was formulated to implement the Environment Protection Law of the People's Republic of China, protect agricultural land and soil environment, control contamination risks of agricultural land, ensure quality safety of the agricultural products and growth of crops, and protect soil ecology environment.

This standard specified risk screening limits and control limits for soil of agricultural land and monitoring, implementation, and supervision requirements.

This standard was published first in 1995, this version is the first revision.

The major revision of the edition included:

- Name of the standard changed from Soil Environmental Quality Standard to Soil Environmental Quality Risk Control Standard for Soil Contamination of Agricultural Land (Trial Edition).
- Updated normative references and added standard terms and definitions.

- Specified risk screening values for basic items such as cadmium, mercury, arsenic, lead, chromium, copper, nickel, and zinc and other items such as BHC, DDT, and benzo[a]pyrene for soil of agricultural land.
- Specified the risk control values of cadmium, mercury, arsenic, lead, and chromium in soil of agricultural land.
- Updated the monitoring, implementation, and supervision requirements.

From the date of implementation of this standard, the previous Soil Environmental Quality Standard (GB 15618-1995) shall be abolished.

This standard was organized and formulated by the Department of Soil and Environment Management and the Department of Science and Technology Standard of the Ministry of Ecology and Environment.

The main drafting units of this standard include Nanjing Institute of Environmental Sciences of the Ministry of Ecology and Environment, Nanjing Institute of Soil Science of the Chinese Academy of Sciences, Institute of Agricultural Resources and Agricultural Zoning of Chinese Academy of Agricultural Sciences, and Chinese Academy of Environmental Sciences.

This standard was approved by the Ministry of Ecology and Environment on May 17, 2018.

This standard shall be implemented from August 1, 2018.

This standard shall be interpreted by the Ministry of Ecology and Environment.

1. Scope of Application

This standard was formulated of risk screening values and control values for soil contamination of agricultural land, and its monitoring, implementation, and supervision requirements.

This standard is used for risk screening and classification for soil contamination of agricultural land. Gardens and pastures can refer to this standard.

2. Normative References

The contents of this standard refer to the following documents or their provisions. For undated referenced documents, the latest versions apply to this standard.

GB/T14550 Soil quality determination of BHC and DDT gas chromatography
GB/T 17136 Soil quality determination of total mercury cold atomic absorption spectrophotometry
GB/T 17138 Soil quality determination of copper and zinc flame atomic absorption spectrophotometry
GB/T 17139 Soil quality determination of nickel flame atomic absorption spectrophotometry
GB/T 17141 Soil quality determination of lead and cadmium graphite furnace atomic absorption spectrophotometry

GB/T 21010 Land status classification
GB/T 22105 Soil quality determination of total mercury, total arsenic, and total lead atomic fluorescence spectrometry
HJ/T 166 Soil environment monitoring technique protocol
HJ 491 Determination of total chromium in soil flame atomic absorption spectrophotometry
HJ 680 Soil and sediments determination of mercury, arsenic, selenium, bismuth, and antimony microwave digestion/atomic fluorescence spectrometry
HJ 780 Soil and sediments determination of inorganic elements wavelength dispersive X-ray fluorescence spectrometry
HJ 784 Soil and sediments determination of semi-volatile organic compounds gas chromatography mass spectrometry
HJ 803 Soil and sediments determination of 12 metal elements by aqua regia extraction-inductively coupled plasma mass spectrometry
HJ 805 Soil and sediments determination of polycyclic aromatic hydrocarbons gas chromatography-mass spectrometry
HJ 834 Soils and sediments determination of semi-volatile organic compounds gas chromatography mass spectrometry
HJ 835 Soil and sediments determination of organochlorine pesticides gas chromatography mass spectrometry
HJ 921 Soil and sediments determination of organochlorine pesticides gas chromatography spectrometry
HJ 923 Soil and sediments determination of total mercury catalytic pyrolysis cold atomic absorption spectrophotometry

3. Terms and Definitions

Below terms and definitions apply to this standard.

3.1 Soil

It refers to the complex of loose porous material layers on the land surface that can grow plants and its related natural geographical elements.

3.2 Agricultural land

Refers to 01 cultivated land (0101 paddy field, 0102 irrigated land, and 0103 dry land), 02 garden land (0201 orchard and 0202 tea garden), and 04 grassland (0401 natural grassland and 0403 artificial grassland) in GB/T 21010.

3.3 Soil contamination risk of agricultural land

Refers to harmful impact on the quality and safety of edible agricultural products, crops growth, or soil ecological environments due to soil contamination.

3.4 Risk screening values for soil contamination of agricultural land

It means that if the contaminants content in the soil of agricultural land is equal to or lower than this value, the risk to the quality and safety of agricultural products, crop growth, or the soil ecological environment is low, the risk can generally be ignored. If it exceeds this value, there may be risk to the quality and safety of agricultural products, crop growth, or the soil ecological environment, soil environmental monitoring and agricultural products coordinated monitoring should be strengthened, so safety utilization measures should be taken in principle.

3.5 Risk intervention values for soil contamination of agricultural land

When contaminants content in the agricultural land exceeds the value, and when edible agricultural products are not qualified for quality standards and the risk of soil contamination is high, strict control measures should be taken in principle.

4. Risk Screening Values for Soil Contamination of Agricultural Land

4.1 Basic items

4.1.1 The basic items for risk screening value of soil contamination of agricultural land are mandatory items, including cadmium, mercury, arsenic, lead, chromium, copper, nickel, zinc, please refer to Table 1 for screening values limits.

Table 1: Risk Values Limits for Agricultural Land (basic items) (unit: mg/kg)

Serial No	Items [1) 2)]		Risk screening values			
			pH ≤5.5	5.5<pH ≤6.5	6.5<pH ≤7.5	pH>7.5
1	Cadmium	Paddy field	0.3	0.4	0.6	0.8
		Other	0.3	0.3	0.3	0.6
2	Mercury	Paddy field	0.5	0.5	0.6	1.0
		Other	1.3	1.8	2.4	3.4
3	Arsenic	Paddy field	30	30	25	20
		Other	40	40	30	25
4	Lead	Paddy field	80	100	140	240
		Other	70	90	120	170
5	Chromium	Paddy field	250	250	300	350
		Other	150	150	200	250
6	Copper	Paddy field	150	150	200	200
		Other	50	50	100	100
7	Nickel		60	70	100	190
8	Zinc		200	200	250	300
Note: 1) Heavy metals and metalloid arsenic are calculated based on the total amount of elements.						

2) For flood and drought rotation land, the more stringent risk screening value is used.

4.2 Other Projects

4.2.1 Other items of agricultural land soil pollution risk screening value are optional items, including BHC, DDT and benzo[a]pyrene.

4.2.2 Other projects will be chosen by local environment protection departments according to local soil pollution status and environment requirements.

Table 2: Risk Values Limits for Agricultural Land (other projects) (unit: mg/kg)

Serial number	Items	Values
1	Total BHC[1]	0.10
2	Total DDT[2]	0.10
3	benzo[a]pyrene	0.55
Note: 1) Total BHC is sum of content of α-666, β-666, γ-666, δ-666. 2) Total DDT is total amount of p,p'-DDE, p,p'-DDD, o-p'-DDT, p,p'-DDT.		

5. Risk Control Values of Soil Contamination of Agricultural Land

5.1 The risk control value items for soil contamination of agricultural land include cadmium, mercury, arsenic, lead, and chromium. The risk control values are shown in Table 3.

Table 3: Control Value for Soil Contamination of Agricultural Land (unit: mg/kg)

Serial number	Items	Riks values			
		pH ≤5.5	5.5<pH ≤6.5	6.5<pH ≤7.5	pH>7.5
1	Cadmium	1.5	2.0	3.0	4.0
2	Mercury	2.0	2.5	4.0	6.0
3	Arsenic	200	150	120	100
4	Lead	400	500	700	1000
5	Chromium	800	850	1000	1300

6. Use of Risk Screening and Control Values for Soil Contamination in Agricultural Land

6.1 When the contaminants content in the soil is equal to or lower than the risk screening value specified in Table 1 and Table 2, the risk of soil contamination in agricultural land is low, the risk can be ignored. When the contaminants content is higher than the screening values in Table 1 and Table 2, it may have soil contamination risk in agricultural land, soil environment monitoring and agricultural products coordinated monitoring should be strengthened.

6.2 When the content of cadmium, mercury, arsenic, lead, and chromium in the soil is higher than the risk screening value specified in Table 1, and equal to or lower than the risk screening value specified in Table 3, soil contamination risk may exist, agronomic control and alternative planting and other safe utilization measures should be taken in principle.

6.3 When the content of cadmium, mercury, arsenic, lead, and chromium in the soil is higher than the risk control value specified in Table 3, the edible agricultural products do not meet the quality and safety requirements, and safety measures cannot reduce contamination risks, strict control measures such as prohibiting the planting of edible agricultural products and returning farmland to forests should be adopted in principle.

6.4 The classification of soil environmental quality should be based on this standard, combined with the results of coordinated monitoring of edible agricultural products, and in accordance with relevant technical regulations.

7. Monitoring Requirements

7.1 Monitoring points and sample collection

7.1.1 The layout of monitoring points and sample collection for soil contamination of agricultural land shall comply with HJ/T 166 and other relevant technical regulations.

7.2 Analysis of soil contaminants

7.2.1 The soil contaminants analysis method shall be in accordance with Table 4.

Table 4: Soil Contaminants Analysis Methods

Serial No.	Item	Analysis Method	Standard No.
1	Cadmium	Soil quality - Determination of lead and cadmium - Graphite furnace atomic absorption spectrophotometry	GB/T 17141
2	Mercury	Soil and sediments - Determination of mercury, arsenic, selenium, bismuth, and antimony - Microwave digestion/atomic fluorescence spectrometry	HJ 680
		Soil quality- Determination of total mercury, total arsenic, and total lead - Atomic fluorescence spectrometry Part 1: Determination of total mercury in soil.	GB/T 22105.1
		Soil quality - Determination of total mercury - Cold atomic absorption spectrophotometry	GB/T 17136
		Soil and sediments - Determination of total mercury - Catalytic pyrolysis - cold atomic absorption spectrophotometry	HJ 923
3	Arsenic	Soil and sediments - Determination of 12 metal elements - Aqua regia extraction - Inductively coupled plasma mass spectrometry	HJ 803

		Soil and sediments - Determination of mercury, arsenic, selenium, bismuth, and antimony - Microwave digestion/atomic fluorescence spectrometry	HJ 680
		Soil quality - Determination of total mercury, total arsenic, and total lead - Atomic fluorescence spectrometry Part 2: Determination of total arsenic in soil	GB/T 22105.2
4	Lead	Soil quality - Determination of lead and cadmium - Graphite furnace atomic absorption spectrophotometry	GB/T 17141
		Soil and sediments - Determination of inorganic elements - Wavelength dispersive X-ray fluorescence spectrometry	HJ 780
5	Chromium	Soil quality - Determination of total chromium - Flame atomic absorption spectrophotometry	HJ 491
		Soil and sediments - Determination of inorganic elements - Wavelength dispersive X-ray fluorescence spectrometry	HJ 780
6	Copper	Soil quality - Determination of copper and zinc - Flame atomic absorption spectrophotometry	GB/T 17138
		Soil and sediments - Determination of inorganic elements - Wavelength dispersive X-ray fluorescence spectrometry	HJ 780
7	Nickel	Soil quality - Determination of nickel Flame atomic absorption spectrophotometry	GB/T 17139
		Soils and sediments - Determination of inorganic elements - Wavelength dispersive X-ray fluorescence spectrometry	HJ 780
8	Zinc	Soil quality - Determination of copper and zinc - Flame atomic absorption spectrophotometry	GB/T 17138
		Soils and sediments - Determination of inorganic elements - Wavelength dispersive X-ray fluorescence spectrometry	HJ 780
9	Total BHC	Soil and sediments - Determination of organochlorine pesticides - Gas chromatography mass spectrometry	HJ 835

		Soil and sediments - Determination of organochlorine pesticides - Gas chromatography	HJ 921
		Soil quality - Determination of BHC and DDT - Gas chromatography	GB/T 14550
10	Total DDT	Soil and sediments - Determination of organochlorine pesticides - Gas chromatography mass spectrometry	HJ 835
		Soil and sediments - Determination of organochlorine pesticides - Gas chromatography mass spectrometry	HJ 921
		Soil quality - Determination of BHC and DDT - Gas chromatography	GB/T 14550
11	benzo[a]pyrene	Soil and sediments - Determination of polycyclic aromatic hydrocarbons - Gas chromatography mass spectrometry	HJ 805
		Soil and sediments - Determination of polycyclic aromatic hydrocarbons - High performance liquid chromatography	HJ 784
		Soil and sediments - Determination of semi-volatile organic compounds - Gas chromatography mass spectrometry	HJ 834
12	pH	Soil - Determination of pH potentiometric method	--

8. Implementation and Supervision

8.1 This standard shall be supervised and implemented by the ecological and environmental authorities at all levels with relevant departments such as agriculture and rural affairs.

END OF TRANSLATION

Attachments:

No Attachments.