

A HIDDEN PROBLEM: CHINA'S CONTAMINATED SITE SOIL POLLUTION CRISIS

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INTRODUCTION

China currently has a severe soil pollution problem and no national law governing soil pollution. We believe that China can learn from the United States' soil pollution problem and its solution—the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). China should not adopt CERCLA whole cloth; instead China should adopt a hybrid approach to soil pollution prevention and control that considers China's unique situation.

This paper first looks at the problem of soil pollution in China and the inadequacy of the current laws and regulations to address soil pollution. We next discuss some of the general principles of CERCLA. We then look specifically at contaminated site soil pollution. We look at questions of responsibility through the lens of three case studies in China: the Songjiazhuang District of Beijing; the Pearl of the Yangtze River in Wuhan; and the Shanghai Expo Site. These three case studies raise the questions of: 1. Who is responsible for contaminated site cleanup; 2. When are parties responsible for contaminated site cleanup?; 3. What are parties' responsibilities?; and 4. How should the government hold parties responsible?. To answer these questions, we compare the Ministry of Environmental Protection's (MEP) proposed *Provisional Rules on Environmental Management of the Soil of Contaminated Sites* (draft *Provisional Rules*), China's provincial regulations on soil pollution, Chinese scholars' opinions, and CERCLA.

Comparing these laws and regulations, along with Chinese scholars' opinions on the issue of contaminated site soil pollution in China, has led us to the conclusion that a hybrid

approach is the best approach to address responsibility at contaminated sites in China. Our recommendations apply equally whether China only adopts the *Provisional Rules*, or it adopts a higher-level national law on soil pollution prevention and control.¹ Specifically, the *Provisional Rules* or a national law should include the polluter pays principle and the principle of state responsibility. The scope of liable parties should include the polluter, the land rights user, the land rights owner, and the government. For the question of when a party should be responsible for contaminated site cleanup, before a company closes, moves, or switches to other production, it should assess the soil. At that time, if the soil is polluted, the party is responsible.² Strict and joint and several liability should apply to the responsible party. Whatever the approach, as stated by members of China's National People's Congress, it is high time that China addresses its soil pollution crisis.³

I. THE SOIL POLLUTION PROBLEM IN CHINA AND IN THE UNITED STATES

Whereas the United States became aware of soil pollution in the 1970s, China is just now realizing that it has a soil pollution crisis. In this section, we discuss the extent of soil pollution in China. We also discuss the patchwork of laws and regulations in China that address soil pollution directly or indirectly and the lack of a national level law to address soil pollution. Finally, we discuss how the United States became aware of its soil pollution problem and its solution to the problem—CERCLA.

A. The Extent of Soil Pollution in China

¹ See Appendix 1 for a detailed explanation of terms and of the levels of law and regulations in China.

² See Fan Junrong & Wang Zaixiang, *Draft for Soil Pollution Prevention and Control*, in COLLECTION OF RESEARCH ON DRAFTING A LAW ON PREVENTION AND CONTROL OF SOIL POLLUTION OF PRC 152, art. 25 (2007) (unpublished manuscript) (on file with authors). The MEP asked professors at Wuhan University to write this collection of research to inform the Chinese government on possible soil pollution prevention and control laws.

³ Liu Xiaoxing, *Member of CPPCC, Jiakang, suggests that China should have a soil pollution prevention law as soon as possible* (Mar. 7, 2011), <http://news.cntv.cn/20110307/105954.shtml>.

The extent of soil pollution in China is unknown. Since the 1950s, as China has become more urbanized, many industries have been shut down or relocated outside the cities, leaving behind soil pollution.⁴ This process has accelerated as urban development has increased.⁵ For example, many polluting enterprises have relocated from the Fourth Ring Road of Beijing, Chongqing, Guangzhou, and Shanghai.⁶ According to one scholar, the relocation of industries is one of the main problems of soil pollution prevention and control in China.⁷ The relocation of industries is a problem, because the industries leave behind areas that are highly desirable to developers but that are also severely polluted. In two of the three case studies below, contaminated sites were developed into affordable housing. If there is no system in place to ensure the cleanup of such contaminated sites, then residents at the sites could end up with severe health consequences.

Recognizing a need for a better understanding of soil pollution in China, the State Environmental Protection Agency (SEPA, currently the MEP) and the Ministry of Land and Resources (MLR) launched a three-year soil pollution survey in 2006 with a budget of one billion yuan.⁸ The survey focused on main grain producing and industrial areas, including Jiangsu and Zhejiang provinces in the Yangtze River Delta region, Guandong Province in the Pearl River Delta area, Northeast China's Liaoning Province, and Central China's Hunan Province.⁹ The soil pollution survey is complete, but it has not yet been made public. One reason that the survey has not been made public could be that the soil pollution was found to be so

⁴ THE WORLD BANK, OVERVIEW OF THE CURRENT SITUATION ON BROWNFIELD REMEDIATION AND REDEVELOPMENT IN CHINA 3 (Sept. 2010).

⁵ *Id.* at 4.

⁶ *Id.*

⁷ Zuo Huanshen, *Jia Kang*, member of the national committee of Chinese People's Political Consultative Conference (Mar. 11, 2011), <http://news.cntv.cn/20110307/105954.shtml>. Two other major problems are that China's laws and regulations have lagged behind pollution and that China lacks experience in the standards and methods for assessment of contaminated sites. *Id.*

⁸ *Nation Faces Soil Pollution Problems*, CHINA DAILY, July 19, 2006.

⁹ *Soil Survey to Monitor Pollution*, CHINA DAILY, Apr. 9, 2007.

severe that the government does not want to release the information.

The best information that is currently available is estimates of the extent of soil pollution in China. One estimate is that by the end of the 20th century, about 20 million hectares of cultivated land, 20 percent of the total cultivated land area, were polluted.¹⁰ The industrial “three wastes” pollute 10 million hectares and sewage irrigation pollutes 130 million hectares.¹¹

B. China’s Current Laws and Regulations that Address the Soil Pollution Crisis

China currently has no national-level law or regulation to address the soil pollution crisis.¹² There are two national laws that mention the soil of contaminated sites. These national laws are the *Environmental Protection Law of People’s Republic of China (Environmental Protection Law)* and *The Law of the People’s Republic of China on Prevention and Control of Environmental Pollution by Solid Waste (Solid Waste Law)*. Under China’s *Environmental Protection Law*, a polluting enterprise “that has caused an environmental pollution hazard shall have the obligation to eliminate it and make compensation to the unit or individual that suffered direct losses.”¹³ The *Solid Waste Law* states that units where industrial waste is generated shall take measures to prevent and control pollution.¹⁴ This pollution includes soil pollution.

The only regulations that directly address soil pollution are at the provincial and city level.¹⁵ For example, in March 2006, the Standing Committee of the People’s Congress of Zhejiang Province enacted *The Regulations of Prevention and Control of Environmental*

¹⁰ Sun Yinglan, *20 percent of cultivated land has been polluted in China: Agriculture is facing a serious challenge* (Sept.19, 2010), http://news.hexun.com/2010-09-19/124936104_1.html.

¹¹ The industrial “three wastes” are waste gas, waste water and industrial residue. Zhang Xiaofeng, *The Existing Status and Preventing Countermeasure of Soil Pollution in China*, YOUTH SCIENCE 1 (2009).

¹² In China, the National People’s Congress enacts national-level laws and the laws can include administrative, civil, and criminal remedies. In contrast, administrative bodies enact the national-level regulations and so the regulations can only include administrative remedies.

¹³ *Environmental Protection Law of People’s Republic of China*, art. 41 (1989) [hereinafter *Environmental Protection Law*].

¹⁴ *The Law of the People’s Republic of China on Prevention and Control of Environmental Pollution by Solid Waste*, art. 35 (2004) [hereinafter *Solid Waste Law*].

¹⁵ See Table 1 for China’s laws, regulations, and policies that directly address soil pollution prevention and control.

*Pollution by Solid Waste of Zhejiang Province (Regulations of Zhejiang Province).*¹⁶ In September 2009, the Standing Committee of the People's Congress of Jiangsu Province enacted *The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Jiangsu Province (Regulations of Jiangsu Province)*.¹⁷

Although the government enacted the *Regulations of Zhejiang Province* in 2006, there has been a delay in enforcement until this year.¹⁸ So far, the local environmental protection bureaus have done the majority of the restoration of contaminated sites, because the polluters could not be found or had gone bankrupt.¹⁹ The expenditure for this restoration came from land premiums.²⁰ At one site, the real estate developer restored the site as part of the development cost.²¹ The local environmental protection bureaus do not know the total number of contaminated sites in the province.²²

There are gaps between the *Regulations of Zhejiang Province* and how the local environmental protection bureaus are enforcing them. For example, instead of following the procedures for site assessment set out in the regulations, the government is using the models of the Shanghai Expo and the Beijing Olympics.²³ Another difference is that under the *Regulations*, the polluting enterprise should carry out an environmental impact assessment before it

¹⁶ *The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Zhejiang Province* (2006) [hereinafter *The Regulations of Zhejiang Province*].

¹⁷ *The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Jiangsu Province* (2009) [hereinafter *The Regulations of Jiangsu Province*].

¹⁸ Interview with the Solid Waste Department of the Zhejiang Province Environmental Protection Bureau (Mar. 1, 2011) [hereinafter Zhejiang Province Interview]. To conduct this interview, the authors first contacted the main Zhejiang Province Environmental Protection Bureau via telephone. The secretary directed the authors to the Solid Waste Department. When the authors called the Solid Waste Department, the contact in the Solid Waste Department asked the authors to provide him with a list of questions via email. He then replied to the email questions on March 1, 2011.

¹⁹ *Id.*

²⁰ *Id.* When an individual purchases the right to use the land from the government, this payment is a land premium.

²¹ *Id.*

²² *Id.*

²³ *Id.*

relocates.²⁴ Instead, the government has been undertaking the assessments.²⁵ Zhejiang Province is a testing ground for legal solutions to the soil pollution problem in China and this can explain the gaps between the *Regulations* and what is actually being done. This is similar to the states acting as laboratories in the United States. Although these gaps are understandable, they do illustrate the need for a national-level soil pollution regulation or law in China.

On the national level, the management of contaminated sites is currently divided over several ministries—the MLR, the MEP, the National Development and Reform Commission (NDRC), and the Ministry of Housing and Urban-Rural Development (MOHURD).²⁶ The MLR is responsible for the management of land.²⁷ The NDRC assists in the drafting of environmental protection planning.²⁸ The MOHURD is responsible for urban development plans.²⁹ Because there is no national soil pollution law, the responsibilities of each of these ministries for contaminated site cleanup have not been streamlined.³⁰ There currently is no process to govern what the ministries should do with respect to contaminated sites. As a result, none of these ministries is being held accountable for the cleanup of contaminated sites.

In light of these problems, the MEP has taken more actions regarding soil pollution prevention and control. According to Deputy Minister of Environmental Protection, Wu Xiaoqing, the MEP has five main goals regarding soil pollution prevention and control: 1. to carry out basic research on soil pollution; 2. to improve soil pollution standards and technical specifications; 3. to strengthen the supervision of soil pollution prevention and control by 2015;

²⁴ *The Regulations of Zhejiang Province*, art. 17.

²⁵ Zhejiang Province Interview, *supra* note 18.

²⁶ THE WORLD BANK, *supra* note 4, at 14.

²⁷ *Id.* at 13.

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

4. to enhance scientific and technological support; and 5. to actively carry out international exchanges and cooperation.³¹

In May 2008, the MEP entered into a Work Plan with the Environmental Protection Agency (“EPA”).³² The Work Plan states:

China . . . views very seriously the need to prevent and control soil pollution, with severe polluted soil in some areas, diversified pollution, pollution caused by old and new pollutants. Control is hard as a result of multiple ways of pollution and complex causes. Soil pollution in China is threatening farm produce safety and human health, thus becoming a factor affecting agricultural production, public health and social stability. At present China is engaged in research on policy measures to control soil pollution, and is setting out to legislate in this regard.³³

Under the Work Plan, the EPA will provide the MEP with information on the United States' environmental law experience in soil pollution prevention and control.³⁴

Additionally, the MEP took further steps towards soil pollution prevention and control when it issued a June 2008 directive that ““the company which inherits the debts and rights (of the polluter) should shoulder the responsibility’ for providing financial assistance to restore the productivity of polluted land.”³⁵ Prior to this directive, the policy regarding entities whose management structure had changed was unclear.³⁶ However, Ma Jun, the director of the Beijing-based Institute of Public and Environmental Affairs, noted: “The fact the notice failed to clarify punishments for violators may weaken its enforcement.”³⁷

In 2009, the MEP drafted the *Provisional Rules for the Environmental Management of*

³¹ Overall Strengthening of Prevention and Control of Soil Pollution: Interview with Deputy Minister of Environmental Protection Wu Xiaoqing (July 2008), http://www.china.com.cn/tech/zhuanti/wyh/2008-07/09/content_15976951.htm.

³² United States Environmental Protection Agency, *MOU Annex 5 Work Plan For Sino-US Cooperation In Environmental Law And Enforcement For 2008 And 2009* (May 20, 2008).

³³ *Id.* at 8.

³⁴ *Id.*

³⁵ MEP, *Directive on Completing Environmental Pollution Prevention and Control When Enterprises Move* (2008).

³⁶ *Government Targets Land Pollution*, CHINA DAILY, June 20, 2008.

³⁷ *Id.*

Contaminated Sites, a national level regulation, for three main reasons.³⁸ First, the problem of soil environment in China is so serious that it must be solved by legislation.³⁹ According to a preliminary soil pollution survey, the contamination of the soil is serious at sites left by industry, sites used for the disposal of solid waste, mine areas, oil fields, and agricultural areas.⁴⁰ The majority of the contaminated sites are developed and used without investigation and assessment.⁴¹

Second, the present regulation on prevention and control of soil pollution cannot meet the requirements to control the harm to health and the environment.⁴² Third, awareness of the importance of prevention and control of soil pollution needs to be improved, because soil pollution is invisible and not well understood.⁴³ The formulation of this rule is not only to strengthen supervision and inspection of soil environment protection, but also to improve public consciousness on prevention and control of soil pollution.⁴⁴

Along with the draft *Provisional Rules*, the MEP drafted four regulations: *The Technical Specification for Environmental Site Investigation; The Guidelines for Risk Assessment of Contaminated Sites; The Guidelines for Soil Remediation of Contaminated Sites; and The Technical Guidelines for Environmental Monitoring of Contaminated Sites*.⁴⁵ At a March 25, 2011 Affairs Meeting, Minister Zhou Shengxian stated that the MEP is looking for an

³⁸ *Provisional Rules on Environmental Management of the Soil of Contaminated Sites* (2009) [hereinafter draft *Provisional Rules*].

³⁹ *Id.*

⁴⁰ *Note on the Provisional Rules on Environmental Management of the Soil of Contaminated Sites* (Dec. 15, 2009).

⁴¹ *Id.*

⁴² *Draft Provisional Rules*.

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ Scholars have noted that the current soil environment quality standards in China cannot meet the requirements of soil pollution prevention and control. Without proper standards, China cannot measure whether a restoration has been successful or not. Gong Junwei, Zhang Shengtao & Tian Jun, *Research on the Problem and Solution on China's Contaminated Sites Environmental Management*, ENV'T AND ECOLOGY OF THREE GORGES (Jan. 2010), available at <http://www.cnki.com.cn/Article/CJFDTotal-SXHS201001019.htm>.

opportunity to issue the draft *Provisional Rules* after further modification.⁴⁶

National Laws	Law on Prevention and Control of Soil Pollution (Currently no national law)
National Regulations	Draft Provisional Rules on Environmental Management of the Soil of Contaminated Sites (Provisional Rules)
Local Regulations	The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Zhejiang Province The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Jiangsu Province The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Nanjing City The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Shenyang Province [Expired]
Policy	Directive on Completing Environmental Pollution Prevention and Control When Enterprises Move

Table 1 – Specific Laws and Regulations in China For the Prevention and Control of Soil Pollution

China also has laws and regulations that tangentially address soil pollution.⁴⁷ There are three categories of these laws and regulations. The first category includes general laws or regulations for environmental protection. The second category includes laws that prevent soil pollution by preventing other types of pollution. The third category includes laws and regulations that consider soil to be a resource. These laws and regulations, combined with provincial and city level regulations that directly address soil pollution, form a complicated legal patchwork that is not enough to solve China’s soil pollution crisis. China needs a national-level law, or at the very least a national-level regulation, for the prevention and control of soil pollution.

⁴⁶ Zhou Wenying, Zhou Shengxian held conference of department affairs of MEP, reviewed the “Measures on Reports of the Information of Abrupt environment affairs,” “The Management Method on the Safety and Protection of radioactive isotope and radiation equipment,” and “Provisional Rules on Environmental Management of the Soil of Contaminated Sites, MEP (Mar. 15, 2011), http://www.mep.gov.cn/zhxx/hjyw/201103/t20110325_207637.htm.

⁴⁷ See Table 2 for a list of laws and regulations related to the prevention and control of soil pollution.

General Laws for Environmental Protection	China's Constitution, Article 26 Environmental Protection Law
Laws that Prevent Soil Pollution by Preventing Other Types of Pollution	The Law on Prevention and Control of Environmental Pollution by Solid Waste Air Pollution Prevention and Control Law Law on Prevention and Control of Radioactive Pollution
Laws and Regulations that Consider Soil to be a Resource	Agricultural Law Regulations on the Protection of Basic Farmland Law of the People's Republic of China on Quality and Safety of Agricultural Products Provisions on Land Reclamation

Table 2 – Other Laws and Regulations in China Related to the Prevention and Control of Soil Pollution

C. The Soil Pollution Problem in the United States

While in China recent concern over soil pollution led to drafting the *Provisional Rules*, in the United States, press coverage in the late 1970s and early 1980s of two sites—“Valley of the Drums” and “Love Canal”—set the stage for the passage of CERCLA.⁴⁸ The Love Canal was meant to be a dream community.⁴⁹ However, in the 1920s the site was used as a municipal and industrial chemical dumpsite.⁵⁰ In 1953, the Hooker Chemical Company, which owned the site, covered it over with soil and sold it to Niagara Falls, New York.⁵¹ Homes and a school were built on the site, but by 1978 chemicals were leaching up through the soil and causing birth defects and miscarriages.⁵² The site contained more than eight industrial chemicals.⁵³

Congress responded in 1980 by hastily enacting CERCLA “on the eve of the lame-duck

⁴⁸ Martha L. Judy & Katherine N. Probst, *Superfund at 30*, 11 VT. J. ENVTL. L. 191, 192 (2009).

⁴⁹ Eckardt C. Beck, *The Love Canal Tragedy*, EPA JOURNAL (1979), available at <http://www.epa.gov/history/topics/lovecanal/01.htm>.

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.*

⁵³ Anthony DePalma, *Love Canal Declared Clean, Ending Toxic Horror*, NEW YORK TIMES (Mar. 18, 2004), available at <http://query.nytimes.com/gst/fullpage.html?res=9E05E1DF1231F93BA25750C0A9629C8B63&scp=1&sq=love%20canal&st=cse>.

session of the 96th Congress.”⁵⁴ In 1986, Congress amended CERCLA with the Superfund Amendments and Reauthorization Act (SARA).⁵⁵ CERCLA has two primary purposes: “(1) to encourage the ‘timely cleanup of hazardous waste sites,’ and (2) to ‘plac[e] the cost of that [cleanup] on those responsible for creating or maintaining the hazardous condition.’”⁵⁶ CERCLA liability is: 1. strict; 2. joint and several; and 3. retroactive.⁵⁷

Although CERCLA “has repeatedly been criticized by the courts for its circuitous language, inartful drafting, redundant provisions, and ‘numerous ambiguities attributable to its precipitous passage,’”⁵⁸ there are indicators of its success. One can look at the number of sites added and deleted from the National Priority List, the number of sites with a remedy, and the number of cleanups, as well as other indicia of CERCLA’s success.⁵⁹

III. A HYBRID SOLUTION TO QUESTIONS OF RESPONSIBILITY FOR CONTAMINATED SITE SOIL POLLUTION

Because China currently has no national-level regulation or law on contaminated site soil pollution, China has the opportunity to learn from the United States’ experience with CERCLA. In this section, we discuss what a national-level regulation or law should contain to address questions of responsibility at contaminated sites in China. We look at responsibility through the lens of three case studies in China and discuss the questions of: 1. Who is responsible for contaminated site cleanup; 2. When are parties responsible for contaminated site cleanup?; 3. What are parties’ responsibilities?; and 4. How should the government hold parties responsible?.

⁵⁴ New York v. Solvent Chemical Co., 685 F.Supp.2d 357, 422 (W.D.N.Y. 2010) (quoting Artesian Water Co. v. New Castle County, 851 F.2d 643, 648 (3d Cir. 1988)).

⁵⁵ Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613.

⁵⁶ W.R. Grace & Co.-Conn. v. Zotos Int'l, Inc., 559 F.3d 85 (2d Cir. 2009) (quoting Consol. Edison v. UGI Utils., Inc., 423 F.3d 90, 94 (2d Cir. 2005)).

⁵⁷ See Judy & Probst, *supra* note 48, at 195; Alfred R. Light, *CERCLA's Cost Recovery Statute of Limitations: Closing the Books or Waiting for Godot*, 16 SE. ENVTL. L. J. 245, 246 (2008).

⁵⁸ New York v. Solvent Chem. Co., 685 F.Supp.2d 357, 422 (W.D.N.Y. 2010) (quoting Artesian Water Co. v. New Castle County, 851 F.2d 643, 648 (3d Cir. 1988)).

⁵⁹ Judy & Probst, *supra* note 48, at 205.

To answer these questions, we compare the draft *Provisional Rules*, China's provincial regulations on soil pollution, Chinese scholars' opinions, and CERCLA. We believe China should adopt a hybrid solution to answer the questions of responsibility.

A. Who is responsible for contaminated site cleanup?

As stated above, China is currently facing a problem of many industries relocating to outside of the cities.⁶⁰ This leads to the question of who should be responsible for cleaning up the contaminated sites that are left behind. One illustration of this problem is an affordable housing site in the Songjiazhuang District of Beijing. In the 1950s, this site was an insecticide factory.⁶¹ In the 1980s, a coating factory took over the site.⁶² In 2007, the number one real estate developer in China, the Wangke Company, purchased the site to build affordable housing, knowing that the site was polluted.⁶³ The question is whether the insecticide or coating factories that may have gone out of business should be responsible, or whether the developer, the government, or some other party should be responsible.

Under CERCLA, there are four categories of potentially responsible parties ("PRPs")—entities that are subject to CERCLA liability. These four categories of PRPs are:

- (1) the owner and operator of a vessel or a facility,
- (2) any person who at the time of the disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of,
- (3) any person who by contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport or disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility or incineration vessel owned or operated by another party or entity and containing such hazardous substances, and
- (4) any person who accepts or accepted any hazardous substances for transport to disposal or treatment facilities, incineration vessels or sites selected by such

⁶⁰ THE WORLD BANK, *supra* note 4, at 3.

⁶¹ Ma Li & Zuo Huiping, *The contaminated soil in Songjiazhuang has been restored and the seriously polluted soil has been burned*, XINHUA NEWS (Aug. 28 2008), http://www.bj.xinhuanet.com/bjpd_sdzx/2007-08/28/content_10978642_1.htm.

⁶² *Id.*

⁶³ *Id.*

person, from which there is a release, or a threatened release which causes the incurrence of response costs. . . .⁶⁴

Under China's regulations, the responsible party varies. The draft *Provisional Rules* states that those who pollute the soil or the land rights users are responsible for the contaminated sites.⁶⁵ Similar to CERCLA, if a responsible entity is sold, the party that purchases it becomes responsible for the site remediation, unless otherwise agreed by the parties before the change.⁶⁶ Additionally, if the land use right is sold, then the transferee becomes responsible, unless otherwise agreed by the parties.⁶⁷ If the responsible party cannot be found, then the relevant local people's government is responsible.⁶⁸

The scope of liable parties is narrower under the draft *Provisional Rules* than it is in CERCLA. "Those who pollute the soil" only includes the land rights users and the original polluting entities. "Those who pollute the soil" does not include the transporters of hazardous substances or those who arranged for the disposal of hazardous substances. However, the transporters of the hazardous substances are liable under the *Solid Waste Law*.⁶⁹

Under the *Regulations of Zhejiang Province*, parties that develop or use the former address after the polluting enterprise moves are responsible for cleanup and disposal of the contaminated land.⁷⁰ Those parties that polluted the soil bear the cost of cleaning up the contaminated land.⁷¹ If there is no definite responsible party or the responsible party is totally disabled, then the local government bears the cost of cleanup.⁷²

⁶⁴ CERCLA, 42 U.S.C. §§ 9607(a)(1)–(4).

⁶⁵ Draft *Provisional Rules*, art. 7.

⁶⁶ *Id.* at art. 8.

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Solid Waste Law*, art. 68(8), 75(12), 78.

⁷⁰ *The Regulations Zhejiang Province*, art. 17.

⁷¹ *Id.*

⁷² *Id.*

In contrast, the *Regulations of Jiangsu Province* are specific to industrial solid waste. Under the *Regulations of Jiangsu Province*, the units discharging, collecting, storing, using, or disposing industrial solid waste bear the cost of environmental monitoring, assessment, and restoring.⁷³ The *Regulations of Nanjing City* state that the land rights user or the developer should hire a qualified unit to assess the extent of the pollution, while the polluter bears the cost of the cleanup.⁷⁴ Finally, the MEP issued a directive in June of 2008 stating: “the company which inherits the debts and rights (of the polluter) should shoulder the responsibility for providing financial assistance to restore the productivity of the polluted land.”⁷⁵ So, under China’s laws, regulations, and policies, the responsible party varies from the land rights users, to the polluters, to the government, to units that manage industrial solid waste.

Chinese scholars recommend that the polluter should be responsible for contaminated site cleanup. Scholars Fan Junrong and Wang Zaixiang state that the original polluter should be responsible for restoring the soil.⁷⁶ Another scholar, Li Youyan, believes that polluters should bear the cost of the cleanup and hire qualified professionals to perform the cleanup.⁷⁷ When the polluter cannot be found, or cannot bear the cost, then the current owner or operator of the site should be responsible.⁷⁸ Scholar Chen Xiaohui recommends that the polluters should ultimately be responsible for the contaminated sites, but that the nation should clean up the sites first.⁷⁹

After cleaning up the contaminated soil, then the government should find the responsible

⁷³ *The Regulations of Jiangsu Province*, art. 15.

⁷⁴ *The Regulations of Prevention and Control of Environmental Pollution by Solid Waste of Nanjing City*, Art. 12 (2009) [hereinafter *The Regulations of Nanjing City*].

⁷⁵ MEP, *Directive on Completing Environmental Pollution Prevention and Control When Enterprises Move* (2008).

⁷⁶ Fan Junrong & Wang Zaixiang, *supra* note 2, at 152, art. 6.

⁷⁷ Li Youyan, *Research on the European Union and its Members’ Soil Pollution Restoration System in COLLECTION OF RESEARCH ON DRAFTING A LAW ON PREVENTION AND CONTROL OF SOIL POLLUTION OF PRC 220* (2007) (unpublished manuscript) (on file with authors).

⁷⁸ *Id.*

⁷⁹ Chen Xiaohui, *Talk on the Disadvantage and Improvement of the System of Soil Pollution Prevention and Control Law*, UNIVERSITY OF NORTHWEST POLITICAL SCIENCE AND LAW (May 1, 2008), <http://epub.cnki.net/grid2008/detail.aspx?QueryID=3&CurRec=1>.

parties.⁸⁰ We do not think that this is a practical solution to China's soil pollution problem, because the government does not have the capability of cleaning up all of the contaminated sites in China.

We recommend that China applies the polluter pays principle and the principle of state responsibility to the *Provisional Rules* or a national-level soil pollution prevention and control law to answer the question of who should be responsible for contaminated site cleanup. Equity and fairness underlie both of these principles. First, the polluter, whether an individual, a privately owned company, or a state owned company, should be responsible for paying for contaminated site cleanup. Polluter should be defined as any person who owned or operated any facility that discharged, collected, stored, or disposed of hazardous substances. This definition combines the definitions of potentially responsible parties in CERCLA and polluters in the *Regulations of Jiangsu Province*. Because the ultimate goal is to clean up the soil, a broad definition is necessary in China to capture as many of the responsible parties as possible. Many of China's scholars agree that the polluter pays principle is one of the basic and important principles for China's environmental laws.⁸¹

Second, if the polluter cannot be found, or cannot bear the cost of the cleanup, then the land rights user should be responsible. The lands rights user in China is similar to "the owner and operator of a vessel or a facility" under CERCLA.⁸² Third, when the polluter is uncertain, and the land rights user cannot pay, then the government should have the responsibility of cleaning up the contaminated site under the principle of state responsibility.

⁸⁰ *Id.*

⁸¹ See WANG CANFA, COURSE IN ENVIRONMENTAL LAW STUDY 60–63 (China Political Science and Law Press 1997); WANG JIN, ENVIRONMENTAL LAW 170–75 (Peking University Press, 2006).

⁸² 42 U.S.C. §§ 9607(a)(1).

An example of the government taking on the responsibility of cleanup is seen in the case of Zhejiang Province where the government is using land rights premiums to fund the cleanups.⁸³ The government is responsible for protecting the people's health and welfare. Under China's Constitution, the government has the responsibility of protecting people from environmental hazards.⁸⁴ So, with respect to contaminated sites, the government should have the responsibility of cleanup if the polluter and the land rights user cannot be found, or cannot pay.

This proposed solution is different from CERCLA in that the responsibility is tiered. Applying this solution to the Songjiazhuang District site in Beijing, first any person who owned or operated the insecticide factory or the coating factory would be responsible. The insecticide factory was at the site 60 years ago and the owners or operators of that factory are likely gone. The government may have better luck finding the owners or operators of the coating factory from the 1980s. However, they too may be gone, or may be unable to pay. Since the goal should be to clean up the soil, the next responsible party is the Wangke Company, because they are the current land rights user.

In fact, the Wangke Company did clean up the site, not because there was any law mandating them to do so, but because cleaning up the site enhanced their reputation and allowed them to sell all of the units in their building. In 2007, the Wangke Company, purchased the site to build affordable housing, knowing that the site was polluted.⁸⁵ The Wangke Company proceeded to clean up the polluted soil.⁸⁶ It removed 4,201 square kilometers of seriously contaminated soil and transported it to the Hongshulin Company in Shenzhen City to be

⁸³ We do not know how successful the cleanups using the land rights premiums are, because Zhejiang Province just started cleaning up contaminated sites this year. Zhejiang Province Interview, *supra* note 18.

⁸⁴ *Constitution of the People's Republic of China*, art. 26 (1982) (stating "The state protects and improves the living environment and the ecological environment, and prevents and controls pollution and other public hazards.").

⁸⁵ Ma Li & Zuo Huiping, *supra* note 61.

⁸⁶ *Id.*

burned.⁸⁷ It also removed 12,145 square kilometers of less polluted soil and transported it to the Fangshan District of Beijing to be buried.⁸⁸ The Wangke Company had the capital to fund the 100 million Yuan cleanup.⁸⁹

In sum, the scope of liable parties should be wider under the *Provisional Rules* and under a higher-level national law for the prevention and control of soil pollution. The government cannot rely on companies like the Wangke Company to clean up the sites. The wider range of responsible parties should include the polluters, the land rights users, and the government.⁹⁰ By adopting the polluter pays principle and the principle of state responsibility, and casting a wider net around the responsible parties, China can ensure that the soil is actually cleaned up.

B. When are parties responsible for contaminated site cleanup?

The next major question is when parties should be responsible for contaminated site cleanup. At the Pearl of the Yangtze River in Wuhan, even though a contaminated site was developed into affordable housing, it has still not been cleaned up.⁹¹ The Pearl of the Yangtze River was formerly the site of a chemical plant.⁹² The developer of the site is a well-known state-owned real estate development company.⁹³ The Development and Reform Commission of Wuhan City approved the development in 2007.⁹⁴ Construction of 2,400 households began in 2008 and was completed in October 2010.⁹⁵ When the construction was almost complete, the Environmental Impact Assessment came out stating that the soil was seriously polluted with

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.* This is approximately \$15.4 million.

⁹⁰ Collectively, the land right owners and the land right users are referred to as land right holders.

⁹¹ Yang Wanguo, *An Affordable Housing District of Wuhan Was Built in Contaminated Sites, Starting without Environmental Impact Assessment*, CHINA NEWS (Nov. 30 2010), <http://www.chinanews.com/estate/2010/11-30/2688660.shtml>.

⁹² *Id.*

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

stibonium and organic pollutants.⁹⁶ The developer responded by putting a sheet of plastic over the site, rather than cleaning up the contaminated soil.⁹⁷ Experts predict that because China currently has no national law on the prevention and control of soil pollution, the site will not be cleaned up and there will be a latent crisis.⁹⁸

To solve the problem of when a party is responsible for contaminated site cleanup, CERCLA grants the President broad power to command that PRPs, whether government agencies or private parties, cleanup hazardous waste sites.⁹⁹ The President can direct the Attorney General to file a civil action seeking injunctive relief to abate harm.¹⁰⁰ Alternatively, the EPA, as the President's delegated agent, can issue unilateral administrative orders requiring PRPs to cleanup a site.¹⁰¹ The President has such power:

(1) Whenever (A) any hazardous substance is released or there is a substantial threat of such a release into the environment, or (B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare. . .¹⁰²

Under the draft *Provisional Rules*, parties are responsible when the land use has changed or the land right user has changed.¹⁰³ A land use change means that the contaminated sites are developed into and utilized for the sensitive land use of housing, business, school, park, green area, pleasure ground, agricultural land, and so on.¹⁰⁴ There are three broad types of land use under *The Law of Land Administration of the People's Republic of China*:

'Land for farm use' refers to land directly used for agricultural production, including cultivated land, wooded land, grassland, land for farmland water

⁹⁶ *Id.* Stibonium is bad for the eyes, nose, throat, and skin and can cause cardiac arrest. *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ *Key Tronic Corp. v. United States*, 511 U.S. 809, 814 (1994).

¹⁰⁰ *Solutia, Inc. v. McWane Inc. et al.*, 2010 WL 2976945 (N.D.Ala.), at *12.

¹⁰¹ 42 U.S.C. § 9606(a).

¹⁰² *Id.* at § 9604(a)(1).

¹⁰³ Draft *Provisional Rules*, art. 2.

¹⁰⁴ *Id.* at art. 4.

conservancy and water surfaces for breeding; ‘land for construction use’ refers to land on which buildings and structures are put up, including land for urban and rural housing and public facilities, land for industrial and mining use, land for building communications and water conservancy facilities, land for tourism and land for building military installation. The term ‘land unused’ refers to land other than that for agricultural and construction uses.¹⁰⁵

The Law of Land Administration of the People’s Republic of China further states that land should be used as defined in the land use type.¹⁰⁶ These land use categories are broad and so the land use may not change.

Under *The Regulations of Zhejiang Province*, a party is responsible when a polluting enterprise has moved and an entity wishes to develop or use the property.¹⁰⁷ *The Regulations of Jiangsu Province* state that a party is responsible when the entity closes or relocates.¹⁰⁸ *The Regulations of Nanjing City* state that when a developer is contemplating developing the land that was the former site of the petrochemical, printing, dyeing, or electroplating industries; or an industrial waste site; or has other polluted soil then the site needs to be cleaned up.¹⁰⁹ Unlike CERCLA, none of China’s regulations state that a party is responsible as soon as the soil is contaminated. Rather, China’s regulations trigger responsibility when the land use changes, the land rights user changes, the polluter moves, or a developer is contemplating developing a site.

Scholars Fan Junrong and Wang Zaixiang have proposed a very specific article for a national-level soil pollution prevention law that answers the question of when a party should be responsible.¹¹⁰ The proposed article states:

When those units who produce, store, or use hazardous chemicals, stop production, switch to other production, or stop doing business, and meet the following list of activities, then the environmental department above the county

¹⁰⁵ *The Law of Land Administration of the People’s Republic of China*, art. 4.

¹⁰⁶ *Id.*

¹⁰⁷ *The Regulations of Zhejiang Province*, art. 17, 52.

¹⁰⁸ *The Regulations of Jiangsu Province*, art. 15.

¹⁰⁹ *The Regulations of Nanjing City*, art. 12, 17.

¹¹⁰ Fan Junrong & Wang Zaixiang, *supra* note 2, at 126, art. 25.

level should order the unit to make corrections within a time limit and impose a fine above 10,000 RMB and below 30,000 RMB. The activities are: the units did not investigate the soil or groundwater of their factory site according to national relevant environmental protection standards or regulation; the units have not established their environmental risk assessment report and send it to the environmental protection department; or the units have not sent their environmental restoration method to environmental protection department above the county level for report and approval and directly carried out environmental restoration.¹¹¹

Like Fan Junrong & Wang Zaixiang, we believe that before a company closes, moves, or switches to other production, it should have to assess the soil. At that time, if the soil is polluted, the company should be responsible. Under this recommendation, a party is responsible sooner than under the draft *Provisional Rules*, because the land rights user or land rights use does not necessarily have to change for a party to become responsible. Additionally, the responsible party must assess the soil, and so pollution will be found earlier.

Holding companies liable as soon as they pollute as under CERCLA, however, may be unrealistic in China where there is currently an unknown number of polluted sites and no system in place to monitor them. This recommendation would help reduce the incidences of companies moving from the cities and leaving severely polluted sites, because they would have to assess the soil before leaving and report their results to the government. So, in the case of the Pearl of the Yangtze River, the chemical plant would have to assess the soil before it moved or closed down. Because the soil was polluted, the chemical plant would then be responsible for cleaning up the soil. Instead, the developer purchased the site not knowing that the soil was polluted. By the time the soil had been tested, the affordable housing had already been built.

One problem with this solution is that fewer companies may close, move, or switch to other production. Companies will know that if they do, then they might be responsible for contaminated site cleanup. Even with this drawback, this recommendation is a hybrid solution

¹¹¹ *Id.*

that will be an important first step to ensure the cleanup of contaminated sites. In the future, as China builds the governmental framework to monitor and assess contaminated sites, then it may be appropriate for China to adopt a system similar to the United States' where PRPs are responsible as soon as the soil is contaminated.

C. What are parties' responsibilities?

A third question is what parties are responsible for. These responsibilities can be divided into two categories—what the polluters are responsible for and what the government is responsible for. The Shanghai Expo Site is an example where the government was heavily involved. SEPA set the standards for the cleanup and the City of Shanghai performed the cleanup.¹¹²

The Shanghai Expo Site is located in an old manufacturing district near the Huangpu River.¹¹³ The Pudong Iron and Steel Company, the Nanshi Power Plant, and China's "First Factory," the Jiangnan Shipyard Construction Factory were all at this site at one time.¹¹⁴ The soil at the site was severely polluted with heavy metals and polynuclear aromatic hydrocarbons.¹¹⁵ Because there is no national law on contaminated site soil pollution, the Research Academy of Environmental Sciences of Shanghai drafted relevant assessment standards for Expo Site Soil Environmental Quality before the Expo buildings were constructed.¹¹⁶ SEPA announced an Environmental Quality Assessment Standard for the soil at the Expo Site on June 5, 2007.¹¹⁷

Before construction of the Expo buildings, the City of Shanghai removed the contaminated soil and transported it to the Old Port rubbish site in Shanghai where it was stored

¹¹² Li Ying & Cai Xinhua, *Expo Site Restores Contaminated Land Successfully*, CHINA ENVTL. NEWS (Jan. 10, 2011), http://www.cenews.com.cn/xwzx/dfxw/qt/201101/t20110110_691595.html.

¹¹³ *Id.*

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.* This standard was provisional and was similar to developed countries' assessments. *Id.*

by the segregation method.¹¹⁸ Clean soil was then backfilled into the site.¹¹⁹ For the Expo buildings that were not built as rapidly, the city adopted new technology called stabilization or curing techniques.¹²⁰ The stabilizer or curing agent was added to produce a chemical reaction that fixed the pollutants in a dense solid.¹²¹ This method stopped the release of the pollutants.¹²²

After the cleanup, the soil quality was assessed and it met the standards set forth by the Research Academy of Environmental Sciences of Shanghai and SEPA.¹²³ The Shanghai Expo Site assessment standards and cleanup are recommended as a model by some scholars¹²⁴ and are currently being used as a model by the Zhejiang Province Environmental Protection Bureau.¹²⁵ However, China's administrative departments for environmental protection have little resources and manpower, so this level of governmental involvement cannot be replicated at every contaminated site.

CERCLA balances PRP involvement and governmental involvement for the cleanup of contaminated sites. Under CERCLA, PRPs are responsible for:

(A) all costs of removal or remedial action incurred by the United States Government or a State or an Indian tribe not inconsistent with the national contingency plan; (B) any other necessary costs of response incurred by any other person consistent with the national contingency plan; (C) damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss resulting from such a release; and (D) the costs of any health assessment or health effects study carried out under section 9604 (i) of this title.¹²⁶

Under CERCLA, there are two types of cleanup activities: “removal” and “remedial” actions. Removal means:

¹¹⁸ *Id.* It is not clear how the soil was segregated at the site.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² *Id.*

¹²³ *Id.*

¹²⁴ See Zuo Huanshen, *supra* note 7.

¹²⁵ Interview with Zhejiang Province.

¹²⁶ 42 U.S.C. §§ 9607(a)(4)(A)–(D).

the cleanup or removal of released hazardous substances from the environment, such actions as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release.¹²⁷

Remedial action means “those actions consistent with permanent remedy taken instead of or in addition to removal actions in the event of a release . . . to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment.”¹²⁸

The cleanup process takes place in seven phases.¹²⁹ In the Preliminary Assessment and Site Inspection phase, the EPA evaluates the potential for a release of hazardous substances from a site.¹³⁰ Next, the most serious sites are listed on the National Priority List (NPL).¹³¹ After a site is listed on the NPL, an environmental engineer conducts a remedial investigation/feasibility study at the site.¹³² In the remedial investigation, data is collected to characterize site conditions and the nature of the waste.¹³³ The Feasibility Study identifies alternative remedial actions.¹³⁴ The EPA then issues a Record of Decision that explains which cleanup alternatives will be used.¹³⁵ In the Remedial Design Phase, the PRPs, along with environmental engineers and the

¹²⁷ *Id.* at § 9601(23).

¹²⁸ *Id.* at § 9601(24).

¹²⁹ See Table 3 for a comparison of the Phases of Contaminated Site Investigation and Cleanup under CERCLA and the draft *Provisional Rules*.

¹³⁰ *Preliminary Assessment/Site Inspection*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/superfund/cleanup/pasi.htm> (last visited Nov. 19, 2010).

¹³¹ *National Priorities List (NPL) Site Listing Process*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/superfund/cleanup/npl.htm> (last visited Nov. 19, 2010).

¹³² *Remedial Investigation/Feasibility Study*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/superfund/cleanup/rifs.htm> (last visited Nov. 19, 2010).

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ *Record of Decision*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/superfund/cleanup/rod.htm> (last visited Nov. 19, 2010).

government, design the technical specifications for cleanup remedies and technologies.¹³⁶ In the Remedial Action phase, the PRPs construct and implement the cleanup.¹³⁷ The EPA then determines whether the cleanup has been successfully completed.¹³⁸

Under the draft *Provisional Rules*, the responsible party has the obligation of: 1. investigating; 2. assessing; and 3. managing and repairing the site.¹³⁹ During the site investigation phase, the responsible party hires an institution with relevant qualifications to investigate and assess the soil environment.¹⁴⁰ The site investigation includes assessing: 1. the basic situation of the contaminated site; 2. the land utilization types and the change of land use right users of the contaminated site; 3. the main productive operation and the source of pollution in the contaminated site; 4. the construction, equipment, and facilities in the contaminated site; 5. the environmental conditions such as the groundwater, within and around the contaminated site and the sensitive targets; and 6. the scope and degree of the soil pollution within and around the contaminated site.¹⁴¹ There are three stages of site investigation and at each stage the institution submits a report to the local administrative department for environmental protection at the county level.¹⁴²

Next, if necessary, the land rights user hires an institution with relevant qualifications to control and repair the contaminated site within a period of twelve months from the receipt of notification from the local administrative department for environmental protection at the county

¹³⁶ *Remedial Design/Remedial Action*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/superfund/cleanup/rdra.htm> (last visited Nov. 19, 2010).

¹³⁷ *Id.*

¹³⁸ *Construction Completions*, ENVTL. PROTECTION AGENCY, <http://www.epa.gov/superfund/cleanup/ccl.htm> (last visited Nov. 19, 2010).

¹³⁹ Draft *Provisional Rules*, art. 8.

¹⁴⁰ *Id.* at art. 11.

¹⁴¹ *Id.*

¹⁴² *Id.* at art. 13.

level.¹⁴³ The remediation plan includes: 1. the scope and the aim of the treatment and remediation; 2. the technical specifications of the remediation; 3. the environmental protection measures of the remediation; 4. the implementation schedule of the remediation; and 5. the supervision plan of the treatment and remediation.¹⁴⁴ The land rights users hire surveillance institutions to supervise the project implementation.¹⁴⁵ The land rights user also entrusts a third party with corresponding qualifications to check and accept the control and remediation project, submit a report to the administrative department for environmental protection at the provincial level, and send duplicates to the local administrative department for environmental protection at the county level.¹⁴⁶

China – Draft Provisional Rules	United States – CERCLA
1. Preliminary Investigation on the Soil Environment of the Contaminated Site (Outside Institution reports to the local environmental protection bureau at the county level)	1. Preliminary Assessment and Site Inspection (EPA)
	2. Site listing on the National Priority List (EPA)
2. Exhaustive Investigation of the Site's Soil Environment (Outside Institution reports to the local environmental protection bureau at the county level)	3. Remedial Investigation/Feasibility Study (Outside Institution)
3. Risk Assessment of the Site Soil Pollution (Outside Institution reports to the local environmental protection bureau at the county level)	
	4. Record of Decision (EPA)
4. Remediation Plan (Outside Institution)	5. Remedial Design (PRPs, Environmental Engineers, and EPA)
5. Remedial Action (Supervised by Outside Institution)	6. Remedial Action (Supervised by EPA)
	7. Determination of Whether Cleanup was Successful (EPA)

Table 3 – Phases of Contaminated Site Investigation and Cleanup

¹⁴³ *Id.* at art. 15.

¹⁴⁴ *Id.* at art. 17.

¹⁴⁵ *Id.* at art. 19.

¹⁴⁶ *Id.* at art. 22.

CERCLA and the draft *Provisional Rules* contain the same basic site remediation process. However, under CERCLA, the government plays a more active role. EPA is directly involved throughout the process. In contrast, in the draft *Provisional Rules*, outside institutions play a large role. Instead of a local environmental protection bureau directly overseeing the remediation process, outside institutions oversee the cleanup and then report to the local bureau. Outside institutions develop the remediation plan, without input from the local environmental protection bureaus.

Another difference between CERCLA and the draft *Provisional Rules*, is that under CERCLA there is no distinction made between the role of the different types of potentially responsible parties. Under the draft *Provisional Rules*, however, the land rights users have more responsibilities than those who polluted the soil.¹⁴⁷ Under Articles 15, 19, and 22 it is the land rights users, not those who polluted the soil, that are responsible for hiring outside institutions to do the cleanup and supervise the cleanup. This is similar to the *Regulations of Zhejiang Province*, where the person who develops or uses the land is responsible for the cleanup and the entities that polluted the soil bear the cost of the cleanup.¹⁴⁸

Under the *Regulations of Jiangsu Province*, the responsible parties must: 1. monitor and assess the extent of the pollution in the groundwater and the former site soil; 2. do an environmental risk assessment report and submit it to local governments above the county level for the record; and 3. clean up the contamination.¹⁴⁹ The *Regulations of Nanjing City* state that the responsible parties should carry out environmental risk assessment and restore or dispose of the soil polluted by the solid waste.¹⁵⁰ The restoration should follow the principles of safety and

¹⁴⁷ The land rights user could be the polluter.

¹⁴⁸ *The Regulations of Zhejiang Province*, art. 17.

¹⁴⁹ *The Regulations of Jiangsu Province*, art. 15.

¹⁵⁰ *The Regulations of Nanjing City*, art. 13.

feasibility and should eliminate the harm to the environment and human health.¹⁵¹ If industrial solid waste sites are discontinued or closed, the responsible parties should monitor the site and ensure safe protection in accordance with relevant regulations.¹⁵²

Scholars Fan Junrong and Wang Zaixiang recommend that polluters should do a site assessment before the end of the original production activity or if they change the original land use nature of the former land.¹⁵³ Polluters should then send the analysis report to the environmental protection bureau above the provincial level for investigation.¹⁵⁴ The polluter should also formulate a soil function restoration map.¹⁵⁵ The local environmental protection bureau should be responsible for the soil investigation and monitoring work.¹⁵⁶

Scholar Li Youyan recommends that the polluters should hire qualified companies to carry out the cleanup.¹⁵⁷ Additionally, the government's main responsibility should be to stop the pollution source.¹⁵⁸ The local environmental protection bureaus should also be responsible for soil restoration, investigation, and monitoring.¹⁵⁹

We recommend that China's environmental protection bureaus should have more responsibility than currently outlined in the draft *Provisional Rules*. However, China should not copy the process from CERCLA. China's environmental protection bureaus have less resources and manpower than the EPA. Therefore, it would be impractical for the bureaus to be involved at every stage of the site investigation and cleanup. The bureaus should have more involvement

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ Fan Junrong & Wang Zaixiang, *supra* note 2.

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ Li Youyan, *supra* note 77.

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

than just reading reports from outside institutions, because if there is no oversight then there will be no enforcement of a national-level soil pollution law or regulation.

We recommend that the MEP should oversee the cleanup at the most severely contaminated sites. Even though the MEP typically just oversees the work of the local environmental protection bureaus, in severe soil pollution cases we believe that the MEP should play a direct role in the cleanup. These severe soil pollution cases affect more people and should be given the utmost care. The MEP should also do an overall investigation of the state of contaminated sites in China and create a list similar to the National Priority List under CERCLA to keep track of the severely polluted contaminated sites in China.¹⁶⁰

The local environmental protection bureaus should also have more responsibilities than currently outlined in the draft *Provisional Rules*. The local environmental protection bureaus should oversee the less severely contaminated sites and should work with MEP on the sites with severe contamination. This latter arrangement is similar to the United States, where state environmental protection departments typically work with EPA to oversee the cleanup of Superfund sites. More governmental oversight will help to ensure that the process runs smoothly and that soil is cleaned up to acceptable levels.

With respect to polluters' responsibilities, the polluter should initially have the burden of cleanup. Before a company closes, moves, or switches to other production, it should assess the soil. If the soil is contaminated, then the responsible parties should hire qualified outside companies to do the cleanup. The goal of this process is to discourage polluters from continuing to pollute in the future.

At the Shanghai Expo Site, the result may have been the same under these

¹⁶⁰ Xu Qi, *Investigation on the Situation of China's Soil: Unseen Pollution is all but Irreversible* (Dec. 28, 2006), <http://env.people.com.cn/GB/5226062.html>.

recommendations. Because this site was severely polluted, the MEP would have been involved in directly overseeing the process. If the polluters of the site could not be found, then the government would be responsible as a land rights user for the cleanup of the site. China needs to carefully develop a system that ensures there is a proper level of governmental involvement and involvement of the responsible parties so that the soil is cleaned up to safe levels, as it was at the Shanghai Expo Site.

D. How should the government hold parties responsible?

1. Civil, Administrative, and Criminal Liability in China¹⁶¹

The final major question of contaminated site responsibility is how should the government hold parties responsible. The government did not hold any parties responsible at the Songjiazhuang site, the Pearl of the Yangtze River site, or the Shanghai Expo site. The government was lucky that the developer cleaned up the Songjiazhuang site and the government cleaned up the Shanghai Expo site itself. The problem of how to hold parties responsible remains at the Pearl of the Yangtze River site, where the developer has only placed a sheet of plastic over the site and the underlying contaminated soil has not been cleaned up.

In China, as in the United States, civil liability applies if an environmental tort happens. According to the *General Principles of the Civil Law of the People's Republic of China*, civil liability for environmental torts can include cessation of infringements, removal of obstacles, elimination of dangers, restoration of original condition, and compensation for losses.¹⁶² If an environmental tort happens, the polluter can be held liable under no fault liability.¹⁶³ This is

¹⁶¹ See Table 4 for a list of the tools available to the government under civil, administrative, and criminal liability in China.

¹⁶² *General Principles of the Civil Law of the People's Republic of China*, art. 134 (1986).

¹⁶³ *Tort Law of the People's Republic of China*, art. 65 (2010) [hereinafter *Tort Law*].

based on the concept that the victims are weak and polluters are more powerful, so the polluters should be held liable.

Administrative liability is the main method of liability used in China's environmental protection laws including the *Environmental Protection Law*,¹⁶⁴ the *Solid Waste Law*,¹⁶⁵ and *Rules on Preventing and Controlling Hazardous Chemical Waste Environment Pollution*.¹⁶⁶ A key principle of administrative liability is that all of the administrative agencies must follow the laws and be strict in performing their official duties.¹⁶⁷

Under the *Environmental Protection Law*, an institution that violates the law can be subject to a fine, although the amount of the fine is not enumerated.¹⁶⁸ Additionally, in serious cases, the institution can be subject to administrative sanctions.¹⁶⁹ Under the *Solid Waste Law*, the administrative fines are specified. When an entity violates the law, “the administrative department for environmental protection of the people's government at or above the county level shall instruct it to discontinue the violation and to rectify within a time limit, and may impose on it a fine.”¹⁷⁰ An entity that commits certain listed acts, “shall be fined not less than RMB 5,000 Yuan but not more than 50,000 Yuan.”¹⁷¹ The department for environmental protection can fine not less than 10,000 Yuan but not more than 100,000 Yuan for other acts.¹⁷² If mining enterprises fail to properly close mines, the department for environmental protection may fine them not less than 50,000 Yuan but not more than 200,000 Yuan.¹⁷³ The *Rules on Preventing and Controlling Hazardous Chemical Waste Environment Pollution* also specify the amount to

¹⁶⁴ *Environmental Protection Law*, art. 38.

¹⁶⁵ *Solid Waste Law*, art. 68, 73.

¹⁶⁶ *Rules on Preventing and Controlling Hazardous Chemical Waste Environment Pollution*, art. 25.

¹⁶⁷ ZHANG SHUYI, SCIENCE OF ADMINISTRATIVE LAW (2005).

¹⁶⁸ *Environmental Protection Law*, art. 38.

¹⁶⁹ *Id.* The *Environmental Protection Law* also provides for criminal liability. *Id.* at Art. 43.

¹⁷⁰ *Solid Waste Law*, art. 68.

¹⁷¹ *Id.* This fine is for approximately \$750 to \$7,500.

¹⁷² *Id.* This fine is for approximately \$1,500 to \$15,000.

¹⁷³ *Id.* at art. 73. This fine is for approximately \$7,500 to \$30,000.

be fined. Entities that violate the rules will be fined not less than 10,000 Yuan and not more than 30,000 Yuan.¹⁷⁴

Administrative Liability	Fines Make corrections in a limited time Cessation of infringements
Civil Liability	Cessation of infringements Removal of obstacles Elimination of dangers Restoration of original condition Compensation for losses
Criminal Liability	Fines Fixed-term imprisonment

Table 4 – Liability in China

There is also criminal liability in China for environmental pollution. Under *The Criminal Law of China*:

A person who, in violation of the state's regulations, discharges, dumps or disposes radioactive wastes, wastes carrying infectious pathogens, poisonous substances or any other dangerous substances to land, water or air, thus polluted the environment seriously, shall be sentenced to fixed-term imprisonment of not more than three years or criminal detention and concurrently or independently, to a fine, if a serious result or a great loss of public or private property or bodily injury or death of another person is caused; and if the result is especially serious, to fixed-term imprisonment of not less than three years and not more than seven years and concurrently to a fine.¹⁷⁵

The *Environment Protection Law* also provides for criminal liability if there is a serious environmental pollution accident causes heavy damages to property or to human health.¹⁷⁶

2. Liability Under CERCLA and China's Laws and Regulations

CERCLA liability is: 1. strict; 2. joint and several; and 3. retroactive.¹⁷⁷ As stated above, a PRP is liable upon the release or threat of release of hazardous substances. The EPA can then sue the PRPs under § 107. A PRP cannot claim as a defense that it was not negligent or that it

¹⁷⁴ *Rules on Preventing and Controlling Hazardous Chemical Waste Environment Pollution*, art. 25.

¹⁷⁵ *The Criminal Law of China* (2011), art. 338.

¹⁷⁶ *Environmental Protection Law*, art. 43.

¹⁷⁷ See Judy & Probst, *supra* note 48, at 195; Alfred R. Light, *supra* note 57, at 246 (2008).

was following standard industry practice, because strict liability applies.¹⁷⁸ There are only three defenses permitted—a PRP has a defense if the release or threat of release of hazardous substances was caused by an act of God, an act of war, or an act or an omission of a third party if the defendant PRP can prove that it exercised due care and the release was not foreseeable.¹⁷⁹

Additionally, PRPs “may be held jointly and severally liable by the government for the entire cost of a cleanup, even if the party is ‘innocent’ in the sense that it did not contribute to the pollution at the site.”¹⁸⁰ A PRP that is held liable for the entire cost of the cleanup can then bring a contribution action against other PRPs under § 113(f) to apportion the costs.¹⁸¹ The liability of a PRP is capped, unless the release or threat of release of a hazardous substance was the result of willful misconduct or willful negligence, or it violated standard operating procedures, or the PRP fails to cooperate with the government in connection with the response activities.¹⁸²

The *Provisional Rules* were drafted by the MEP and are only a national-level regulation. Thus, parties can only be held responsible under administrative liability. Article 26 of the draft *Provisional Rules* provides that the local environmental protection bureau at the provincial level should order the liable entities “to rectify and reform within a time limit, and punish them

¹⁷⁸ Hongkyun Kim, *Is the Korean Soil Environment Conservation Act’s Liability Too Severe: Learning from CERCLA*, 11 Alb. L. Envtl. Outlook 1, 15–16 (2007).

¹⁷⁹ 42 U.S.C. § 9607.

¹⁸⁰ Solutia, Inc. v. McWane Inc. et al., 2010 WL 2976945 (N.D.Ala.), at *11.

¹⁸¹ 42 U.S.C. § 9613(f).

¹⁸² 42 U.S.C. § 9607(c) (stating “(1) Except as provided in paragraph (2) of this subsection, the liability under this section of an owner or operator or other responsible person for each release of a hazardous substance or incident involving release of a hazardous substance shall not exceed—(A) for any vessel, other than an incineration vessel, which carries any hazardous substance as cargo or residue, \$300 per gross ton, or \$5,000,000, whichever is greater; (B) for any other vessel, other than an incineration vessel, \$300 per gross ton, or \$500,000, whichever is greater; (C) for any motor vehicle, aircraft, hazardous liquid pipeline facility (as defined in section 60101 (a) of title 49), or rolling stock, \$50,000,000 or such lesser amount as the President shall establish by regulation, but in no event less than \$5,000,000 (or, for releases of hazardous substances as defined in section 9601 (14)(A) of this title into the navigable waters, \$8,000,000). Such regulations shall take into account the size, type, location, storage, and handling capacity and other matters relating to the likelihood of release in each such class and to the economic impact of such limits on each such class; or (D) for any incineration vessel or any facility other than those specified in subparagraph (C) of this paragraph, the total of all costs of response plus \$50,000,000 for any damages under this subchapter.”).

according to law.”¹⁸³ Furthermore, if the environmental protection bureau violates the law, supervisory organs “should give disciplinary sanction in accordance with law.”¹⁸⁴ If the liable entities or the outside institutions practice fraud “they shall assume legal responsibility.”¹⁸⁵

The *Regulations of Zhejiang Province* and the *Regulations of Nanjing City* also have administrative liability provisions. Under the *Regulations of Zhejiang Province*, the environmental protection bureau should order any violator of Article 17 to terminate the law-breaking activities and make corrections within a time limit.¹⁸⁶ If the violator fails to do so within the time limit, then the violator shall be fined not more than 50,000 Yuan.¹⁸⁷ The *Regulations of Nanjing City* states that the environmental protection bureau should order any violator of the regulations, who did not restore or dispose of the contaminated soil, to make corrections within a time limit and should impose a fine amounting to between one time and three times the cost of the restoring or disposing of the soil.¹⁸⁸ A fine of between one time and three times the cost of restoring or disposing of the contaminated soil could be extremely high. For example, the cleanup in the Songjiazhuang District of Beijing cost 100 million Yuan.¹⁸⁹ If the *Regulations of Nanjing City* applied, the Wangke Company could face a fine of between 100 and 300 million Yuan if it did not clean up the site.¹⁹⁰

Scholars Fan Junrong and Wang Zaixiang recommend that the environmental department above the county level should order the violators to make corrections within a time limit and impose a fine above 10,000 Yuan and below 30,000 Yuan.¹⁹¹ This proposed amount of fines is

¹⁸³ Draft *Provisional Rules*, art. 24.

¹⁸⁴ *Id.* at art. 28.

¹⁸⁵ *Id.*

¹⁸⁶ *The Regulations of Zhejiang Province*, art. 52.

¹⁸⁷ *Id.* This fine is approximately \$7,500.

¹⁸⁸ *The Regulations of Nanjing City*, art. 13.

¹⁸⁹ Ma Li & Zuo Huiping, *supra* note 61. This is approximately \$15.4 million.

¹⁹⁰ The fine would be between approximately \$15.4 and \$46.2 million.

¹⁹¹ Fan Junrong & Wang Zaixiang, *supra* note 2.

modest, even compared with fines in China's other environmental laws listed above. Scholar Li Youyan states that the government should evaluate the risk level of historical sites.¹⁹² For sites with a lower level risk, the government should take no action.¹⁹³ For sites with higher-level risk, the government should apply the polluter pays principle.¹⁹⁴

3. The Hybrid Approach

We recommend that the draft *Provisional Rules*, or a higher-level national law on the prevention and control of soil pollution should consider China's unique situation. Many companies in China are state-owned and much of the land is state-owned. Additionally, there are "large differences between different regions in terms of economic and social development, availability of supporting infrastructures . . . enabling capacities . . . and, most importantly, population density and thus the consequences of exposure risk."¹⁹⁵

Second, we recommend that China adopts a higher-level national law on the prevention and control of soil pollution. The draft *Provisional Rules* are a good first step, but because they are provisional and can only include administrative remedies, they are limited in scope. A national-level law on the prevention and control of soil pollution, as advocated by scholars Fan Junrong and Wang Zaixiang, is an integrated approach to soil pollution.¹⁹⁶ Such a law would not focus only on controlling contaminated site soil pollution, like the draft *Provisional Rules*, but would also consider agricultural pollution and how to prevent soil pollution in the first place. Under China's *Legislation Law*, this higher-level national law on the prevention and control of soil pollution would have priority over the local regulations on contaminated site soil

¹⁹² Li Youyan, *supra* note 77.

¹⁹³ *Id.*

¹⁹⁴ *Id.*

¹⁹⁵ THE WORLD BANK, INTERNATIONAL EXPERIENCE IN POLICY AND REGULATORY FRAMEWORKS FOR BROWNFIELD SITE MANAGEMENT 41 (Sept. 2010) [hereinafter INTERNATIONAL EXPERIENCE].

¹⁹⁶ Fan Junrong & Wang Zaixiang, *supra* note 2.

pollution.¹⁹⁷

China should adopt this integrated approach to contaminated site soil pollution because it simplifies the legislative process since one law will cover all aspects of soil pollution prevention and control. The definitions and principles in an integrated soil pollution law will apply to all aspects of soil pollution prevention and control, rather than having different common factors for different aspects of soil pollution. China's soil pollution is so severe that it is important that China addresses soil pollution prevention and control now. An integrated approach would ensure that all of China's soil pollution problems are addressed together.

Third, like CERCLA, the *Provisional Rules* or national soil pollution law in China should contain strict liability. Although China is a civil law system with no fault liability, some Chinese scholars believe that no fault liability is the same as strict liability.¹⁹⁸ Other Chinese scholars believe that China has adopted strict liability in its *Tort Law*.¹⁹⁹ Strict liability, or no fault liability that is the same as strict liability, exists in China to put a burden on polluters and to solve the contradiction between economic development and environmental protection. Strict liability should be applied in the soil contamination context because soil pollution is severe and it would place an undue burden on the government to have to prove negligence on the part of the polluter at every site. Even if a polluter was acting in a legal manner, the polluter should have to cleanup the contaminated site to protect the health and safety of all of the residents of China. If a soil pollution law does not adopt this principle, then it is taking a step back from the movement

¹⁹⁷ *The Legislation Law of the People's Republic of China* (2000), art. 78–86.

¹⁹⁸ Xu Chuanxi, *Investigation and Comments About the Situation of China's Torts Law* (Apr. 9, 2002), <http://www.civilaw.com.cn/article/default.asp?id=7789>. Some scholars note that the possible differences between strict liability and no fault liability include that under strict liability, a party is not liable for an act of God or war. Under no fault liability, a party is liable regardless of those types of acts. Wang Limin, *The Liability Doctrine of Civil Liability: The Development of Presumptive-Fault Rules: The Development of Current Doctrine of Liability*, FORUM OF THE LAW (June 2006), <http://law1.cnki.net/kns50/clkd/clkt/detail.aspx?DBName=clkj&FileName=SDFX200606011>.

¹⁹⁹ Yu Yan Yan, *Prof. Wang Li Ming talks about the Character of China's Tort Law* (Jan. 19, 2010), <http://www.sinoss.net/2010/0119/18313.html>.

in China to place more of a burden on the polluters.

Fourth, like CERCLA, the *Provisional Rules* or national soil pollution law in China should contain joint and several liability with a right to contribution. Under joint liability, a responsible party would be liable up to the full amount of the cleanup. Under several liability, a responsible party would only be liable for their percentage share of the cleanup. China's *Tort Law* contains both joint and several liability.²⁰⁰

In the United States, PRPs are held jointly and severally liable. If one PRP is held liable for the full amount of the cleanup, it can then sue other PRPs for their share of the cleanup under a §113(f) contribution claim.²⁰¹ This system promotes efficiency because the government can go after one PRP for the whole cleanup. It also promotes fairness because if a PRP did not cause all of the pollution at a site, it can sue other PRPs to recoup a share of its costs. A drawback of this system, however, is that it leads to a lot of litigation that may not be practical in China as China's judicial system is still developing.²⁰²

Although joint and several liability with a corresponding right to contribution may not be ideal for China, the alternatives would be either unfair to the public or to the responsible parties. If a national level soil pollution law contained only joint liability then the sites would get cleaned up, but a party who only contributed ten percent of the pollution to the site could be liable for one hundred percent of the cleanup. If, on the other hand, a national-level soil pollution law contained only several liability then the government would have a heavy burden. The responsible party and the government would have to battle in court over the responsible party's appropriate

²⁰⁰ *Tort Law*, art. 12 (stating "Where two or more persons commit torts respectively, causing the same harm, if the seriousness of liability of each tortfeasor can be determined, the tortfeasors shall assume corresponding liabilities respectively; or if the seriousness of liability of each tortfeasor is hard to be determined, the tortfeasors shall evenly assume the compensatory liability."); *Id.* at Art. 14 (stating "A tortfeasor who has paid an amount of compensation exceeding his contribution shall be entitled to be reimbursed by the other tortfeasors who are jointly and severally liable.").

²⁰¹ 42 U.S.C. § 9613(f) (2006).

²⁰² INTERNATIONAL EXPERIENCE, *supra* note 195.

share of the cleanup. Then, the government would have to find the other responsible parties, or pay for the rest of the cleanup itself. The loser in this situation is the public. With joint and several liability and a corresponding contribution action, China can strike a balance between fairness for the public and fairness for the responsible parties. As China's court system further develops, it will be better able to handle contribution action cases.

Fifth, the *Provisional Rules* or national soil pollution law in China should contain the polluter pays principle. Under Chinese laws, unlike in the United States, liability is not retroactive. However, the MEP's *Directive on Completing Environmental Pollution Prevention and Control When Enterprises Move* supports retroactive liability.²⁰³ It states that even though the original polluter has moved, the original polluter should be responsible for cleaning up and restoring the soil for environmental pollution problems caused by remaining pollutants.²⁰⁴ The *Provisional Rules* or a national-level soil pollution law should adopt the polluter pays principle to enhance the MEP's policy and ensure the cleanup of sites that were polluted in the past. The absence of retroactive liability in China's laws and regulations is a problem because, as noted above, many of the contaminated sites contain historical pollution. Under the polluter pays principle, it does not matter when a site was polluted. Instead, the focus is on making the polluter pay for the contamination.²⁰⁵

Finally, it is a doctrine of law in China that specific laws or regulations are superior to the common law. However, if the draft *Provisional Rules*, or a national-level soil pollution prevention and control law, does not specify the types of liability, then the liability provisions of other laws should be read into the regulation or law. So, if the draft *Provisional Rules* is adopted

²⁰³ MEP, *Directive on Completing Environmental Pollution Prevention and Control When Enterprises Move* (2004).

²⁰⁴ *Id.*

²⁰⁵ Scholar Li Youyan recommends using the polluter pays principle to get polluters to pay for historical pollution. Li Youyan, *supra* note 77.

without any changes to the liability provisions, then the liability provisions of laws such as the *General Principles of the Civil Law of the People's Republic of China* and the *Environmental Protection Law* should be read into the *Provisional Rules*. This will ensure that parties are held responsible for soil pollution, even if the applicable provisions in other national laws are not ideal.

CONCLUSION

In conclusion, China's draft *Provisional Rules* are an important step towards a national law on contaminated site soil pollution. The draft *Provisional Rules* identifies three important goals: 1. the need for legislation on soil pollution; 2. the need to protect human health and the environment; 3. and the need to improve public awareness regarding soil pollution.²⁰⁶ However, although the *Provisional Rules* begins to address these goals, improvements are necessary.

China should adopt a hybrid approach to address responsibility at contaminated sites. A higher-level national law on soil pollution prevention and control is needed. A national law on contaminated site soil pollution should include a wider variety of responsible parties, make parties responsible for soil pollution when they close, move, or switch to other production, and place more responsibility on the polluters and the government. A national law should consider China's unique situation, and contain strict liability, joint and several liability, and the polluter pays principle. If the law does not specify the types of liability, then the liability provisions of other national laws should be read into it.

There are no easy answers to the soil pollution problem in China, or anywhere else in the world. China has the advantage of being able to learn from the successes and failures of similar laws in other countries, such as the United States' CERCLA. China should learn from other

²⁰⁶ Draft *Provisional Rules*.

countries and develop a hybrid approach that fits China's situation best. China must act quickly to prevent additional soil pollution and human health risks.

APPENDIX 1

Land Premium	When an individual purchases the right to use the land from the government, this payment is a land premium.
Land Rights Owner	The government, or other group, that owns the land and sells the right to use the land to land rights users.
Land Rights User	The party that purchases the right to use the land from the government, or other land rights owner for a premium.
National-level Laws	National-level laws are the highest level of law in China. As such, national-level laws can contain administrative, civil, and criminal liability.
National-level Regulations	National-level regulations are below national-level laws. National-level regulations are promulgated by national administrative departments and so only administrative liability is available as a remedy.
Provincial-level Regulations	Provincial-level regulations are lower than national-level laws, national-level regulations, national-level policies, and provincial-level laws. They are promulgated by provincial-level administrative departments.
Polluter	We define polluter as any person who owned or operated any facility that discharged, collected, stored, or disposed of hazardous substances.