

NATURAL RESOURCE DAMAGE ASSESSMENT IN PRACTICE : EXPERIENCE OF THE UNITED STATES

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ABSTRACT

The United States actively pursues damage recovery from firms in the event of natural resource damages. This article provides information on this procedure, from the establishing of the legal enforcement, the diversified nature of state agencies, the difficulty of damage assessment and the cumbersome settlement agreement. We find that in order to actively pursue claims, governmental agencies need : human and monetary resources, experiences, support from seniors policy makers and politically conducive environment. Moreover, the task of damage assessment process can be very complicated because of the non-trivial relationship between the assessment accuracy and its associated costs. Finally, we provide a general course of action of how Thailand can benefit from the United States experiences.

Key words: Natural Resource Damage Assessment

บทคัดย่อ

ประเทศสหรัฐอเมริกามีการดำเนินคดีเรียกร้องค่าเสียหายอย่างจริงจังจากผู้ประกอบการ เนื่องจากอุบัติเหตุหรือเหตุการณ์ต่างๆ อันจะก่อให้เกิดความสูญเสียทางสิ่งแวดล้อม บทความนี้นำเสนอข้อมูลเบื้องต้นเกี่ยวกับการประเมินค่าความเสียหายทางสิ่งแวดล้อม โดยครอบคลุมเนื้อหาเกี่ยวกับกฎหมายเฉพาะทาง หน่วยงานที่มีหน้าที่รับผิดชอบ ความลำบากในการประเมินค่า และการต่อสู้คดีที่ยืดเยื้อ จากการสอบถามหน่วยงานของทุกรัฐ สรุปได้ว่าการที่รัฐแต่ละแห่งตัดสินใจที่จะดำเนินคดีอย่างเป็นทางการนั้นมีปัจจัยที่สำคัญ คือ บุคลากรที่มีความรู้ ความสามารถ งบประมาณสนับสนุน และหัวหน้าหน่วยงานที่มีความสนใจในด้านนี้ นอกจากนี้แล้วการเลือกเทคนิคในการประเมินค่าความเสียหายนั้นยังทำได้ยากอีกด้วยเพราะว่ารัฐต้องเลือกระหว่างความถูกต้องแม่นยำของการประเมินค่า และงบประมาณที่จะใช้ในการประเมินข้อมูล

คำสำคัญ: การประเมินค่าความเสียหายของทรัพยากรธรรมชาติ

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I. Background : Natural Resource Damage and Legal Enforcement

Chemical discharges, ruptured pipelines, marine disasters, landfill seepage, and the after-effects of mining are all examples of situations that may cause injuries to natural resources. These may include the destruction of wildlife and their habitats, or of recreational areas, Indian reservations, or, perhaps contamination of groundwater. The extent of the injuries may be assessed and interpreted as natural resource damages (NRDs). For example, the *American Trader* ran aground near Huntington beach, California resulted in the release of about 400,000 gallons of crude oil. The affected natural resources include fish and sea birds, including endangered species, and beaches. The estimated NRDs were \$12.7 million (Helton and Penn, 1999). In addition to direct damages to the natural resources, the release of hazardous materials and oil may pose a threat to human health and lives. In the case of the Montrose Chemical Corporation, for example, there were chronically discharged millions of pounds of DDT and PCBs along the southern California coastline. These chemicals contaminated soils and groundwater and threatened the health of the local population (DARRP 2004).

In the United States, the two main federal natural resource damage (NRD) liability laws are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 1980) and the Oil Pollution Act (OPA, 1980). The events that prompted Congress to pass these two statutes were the discovery of 80,000 tons

of toxic wastes in Love Canal, New York, and the 11 million gallon oil spill from the Exxon Valdez in Prince William Sound, Alaska (Ward and Duffield, 1992). Love canal was a municipal and industrial chemical dumpsite for over two decades before the owner of the property sold it to the city. The city then developed the land into a small town in the late 1950s. Twenty years later, the hazardous waste containers rotted and leached their contents into the populated area. (Beck, 1979) The subsequent investigation established the relationship between the birth-defects and other health related problems of the people in the community and the toxic substances released. This resulted in a dramatic increase on national level of awareness of the dangers of abandoned hazardous waste sites. CERCLA (or the Superfund program) was enacted in 1980 in order to locate, investigate and clean up these sites nationwide.

While CERCLA focuses on the chronicle releases of hazardous substances, the OPA is concerned with both inland and coastal oil spill accidents. It was enacted in 1990 as a response to the *Exxon Valdez* incident, the largest recorded oil spill in the history of the United States. The clean up efforts took several years and cost more than \$2 billion. Due to its pristine location at Prince William Sound, Alaska, the spill became one of the largest environmental disasters in American history, beyond the scope of any other spills.

Both CERCLA and OPA provide guidelines for governmental officials to identify the potentially responsible parties (PRPs), clean up,

evaluate damages, pursue NRD claims, and restore injured resources. PRPs generally refer to those who, through actions or inactivity, injure natural resources. Once proven that injuries cause damages, PRPs become responsible parties (RPs). They are requested to compensate the public for the losses of natural resources. The settlements recovered from NRDs are available for use to restore or replace the injured resources and to reimburse the governmental officials for the costs of assessing damages. In some cases, there may be excess sums left from the above mentioned activities, which the officials may deposit in a special fund (such as the Oil Spill Liability Trust Fund) for future use.

Before any activities are performed, the statutes require that a key organizer is appointed to act on the behalf of the public. Fundamentally, both CERCLA and OPA require that natural resource trustees (trustees) be appointed. There are four possible types of trustees - federal, state, tribal and others (such as foreign governments) (EPA, 2004). The main federal trustees are the Department of Interior (DOI) and the National Oceanic and Atmospheric Administration (NOAA). Generally, DOI is in charge of the inland resources and NOAA has jurisdiction over marine and coastal resources. Federal trustee will oversee cases on a national scale, while a state may be appointed a state trustee when accidents occur in its local jurisdiction.

In many cases, there may be multiple trustees working together. For example, in the case of the oil pipeline that ruptured at Whatcom Creek, Washington, the trustees responsible are :

the National Oceanic Atmospheric Administration, the U.S. Department of the Interior, the State of Washington, the Lummi Nation of Washington, the Nooksack Tribe of Washington, and the city of Bellingham (DARP, 2004). On the other hand, some cases are the province of a single trustee. Such was the case for the Marathon oil spill in Illinois, where the Illinois Department of Natural Resources acted as sole trustee (IL DNR, 2002).

As shown in CERCLA and OPA on the sections of designation of trustees, the legislation only indicates that the states may be appointed natural resource trustees but does not stipulate their level of involvement in NRD actions. It follows that one might expect to see state agencies actively engaged in NRD activities if there have been NRDs in that state ; however, there is no legal requirement for these agencies to act on NRDs. In many states, such as Pennsylvania and Georgia, even though superfund sites and/or oil spill accidents are located in those states, there are still no active state-level NRD programs.

As of Dec 2003 there were 34 states with active NRD programs. The 16 states that do not yet have active programs are : Arizona, Arkansas, Colorado, District of Columbia, Georgia, Idaho, Iowa, Kentucky, Nebraska, New Hampshire, North Carolina, North Dakota, Oregon, Pennsylvania, Tennessee, Vermont, and Wyoming. Comments made by agency respondents indicate that the main reason for a state to develop an NRD program is, naturally enough, the local occurrence of natural resource damages. In many

cases, especially for oil spills, after cleanups or remediation, there might not be any NRDs, or the scope of damages may be insignificant. In such a situation, it is difficult to justify, from a cost effectiveness perspective, the state's investment in conducting a full scale natural resource damage assessment (NRDA). On the other hand, at the other end of the spectrum, notorious 'big cases' provide dramatic impetus for states to start their activities. For example, California, New Jersey and Washington all began their NRD programs in response to large spill incidents.

Once NRDs are discovered, a state that has sufficient resources will have more potential to start their own NRD programs. Due to a lack of human resources, knowledge, and funding, many state trustees only could collaborate with the federal trustees in term of investigation, cleanups, and administrative actions. The task of performing NRDA is carried out in such cases by the federal trustees. This is primarily because specialized personnel are needed to carry out NRDA : staff scientists must investigate the physical injuries, staff economists must conduct damage assessments, and legal staff must negotiate or pursue the claims. The majority of states have no personnel dedicated solely to NRD work. Any NRD-related activities are added on to the usual workload of various state agencies.

Other than human and monetary resources, the state trustees also need strong support and commitment from senior decision-makers both the inside and outside of the organizations. In some cases, NRD programs are established because directors of the state offices or the state

legislators have learned about NRDA. They then work to build support for NRDA in terms of extensive legislation and sources of funding. Other times, the state agencies learn from experiences. At the beginning, state trustees may not have knowledge or resources to perform NRDA's. The federal trustees, who have more experiences, then would perform the tasks. Over time, the state trustees may develop skilled personnel, often motivated by a desire to handle cases on their own, especially those cases in which NRD claims are significant but below the level federal trustees use to become active in a case.

There may be reasons for the state to choose not to establish an active NRD program. For example, it might not be the state's philosophy to pursue NRD claims. Some states prioritize cleanups activities. Some view NRD claims as punitive damages or additional costs that penalize the firms, and they fear that such damage awards would discourage the industry from engaging in voluntary cleanup. Additionally, there may be other local political considerations that discourage the state trustees from establishing active state- level NRD programs. For example, if the polluting industry is the biggest source of employment in the state, having a very active NRD program might hurt the industry and cause the unemployment to rise.

There are reasons for states to implement their own NRD programs. Federal and state trustees are separate organizations: the federal trustees oversee the NRDs of the country as a whole, while each state agency is only responsible within its state's borders. Generally, federal

trustees are interested in large NRD claims, and are less inclined to pursue smaller claims. Therefore, if a state has an active NRD program, it has the option to pursue these smaller cases that otherwise might be ignored. Moreover, NRD liability will serve as an indirect incentive for the industry to take proper precautions and account for social costs. Traditional policies such as taxes and standards are not generally suitable in dealing with NRDs because damages are stochastic and a firm cannot control the exact probability associated with an environmental accident. Legal liability would be more likely to influence the firm's behavior (Segerson 2000). Under strict liability rules covering a NRD provision, the firm knows that it will be liable for the damages. Hence, it will take actions toward reducing or avoiding this payment in the future.

II. Natural Resource Damage Assessment

NRD statutes focus on cleanup activities and on establishing liability for damages to natural resources; naturally, there is a need for appropriate measures of damages to identify the PRPs' liability. Natural resource damage assessment (NRDA) is the process of collecting and analyzing the data to assess the degree of damages and develop restoration plans. Generally, according to DOI regulations, there are three steps in conducting NRDA : pre-assessment, assessment and post-assessment phases^{2/} (EPA,

2004). The pre-assessment process includes gathering field or on-scene data and assessing preliminary damages after the initial cleanup to evaluate whether further NRD assessments and claims are necessary. In the assessment phase, the trustees have to decide on the proper assessment methodology, quantify the damages, and draft the restoration plans. Finally, the trustees will report to the public the damages, and finalize and implement the restoration processes in the post-assessment phase. The central issue of the NRDA procedure is in the assessment phase. Because the underlying principle of the NRD laws is that the polluters pay, a difficult question arises : how much are the damages?

Natural resource damages can be challenging to estimate because most natural resources are not marketed goods with observable prices. In practice, trustees utilize a number of assessment tools that economists have developed. The menu of extant assessment methods ranges broadly in complexity. Simplified methods are inexpensive because they do not use much case-specific data, and apply standard formulas or computer programs to the small amount of data that are collected. In exchange for simplicity, low cost, and speed of use, simplified methods are quite inaccurate. More refined methods developed by economists will yield more accurate damage estimates. However, such methods cannot be employed without large amounts of data and expert analysts. Thus, they

^{2/} The NOAA regulations are slightly different. The process consists of (1) the pre-assessment phase, (2) restoration planning, which involves the injury assessment and restoration selection and (3) restoration implementation.

are much more expensive and time consuming than the simpler methods.

There are extant assessment methods currently used by the state trustees in order to estimate damages. Presently there are thirteen damage assessment techniques that state trustees choose to employ. In practice, the trustees may combine several methods in complex cases (Ando and Khanna, 2002). Discussion of each type is briefly given below:

1. *DOI Type A Computer Model* : Computer models developed by the Department of Interior for using in natural resource damage Type A^{3/};

2. *NOAA Compensation Formulas* : Simple formulas used to estimate damages from small oil spills ;

3. *Benefits Transfer* : Applying results of existing studies of the economic values of resources to the task of valuing damage to similar resources;

4. *Appraisal Method* : Estimating compensable value as the difference between the with- and without-injury appraisal values of a resource ;

5. *Factor Income Analysis* : Damage is the loss of economics rent associated with the use of resources in a production process;

6. *Market Price Analysis* : For resources that can be traded in the market, damage is the diminution in the market price of the injured resources;

7. *Hedonic Pricing Method* : Estimating values of environmental amenities by measuring impact of amenities on price of marketed good ;

8. *Travel Cost Analysis* : Using costs that people incur to travel to an area to estimate its value ;

9. *Averting Behavior Analysis* : Inferring the resource values from observation of how changes in resource induce “defensive” change in human behavior;

10. *Contingent Valuation* : Using hypothetical survey questions to elicit respondents’ willingness to pay to prevent or reduce damages ;

11. *Conjoint Analysis/ Contingent Ranking* : Methods that estimate value of changes in resource attributes by asking respondents to choose between or rank resource alternatives with different attributes;


12. *Habitat Equivalency Analysis (HEA)* : Method of scaling compensatory restoration projects to ensure that replacement service = lost services; and

13. *Others Assessment Methods* : State agencies’ own assessment methods, usually for use in simplified assessments.

These assessment methodologies differ in their complexity. For instance, the main Type A model designed by the Department of the Interior for use in all marine environments across the country cannot account for distinct characteristics of a particular environment. On the other hand, a method such as contingent

^{3/} Type A assessment : standard procedures for simplified assessments require minimal field observation to determine damages as specified in section 301 (c) (2) (A) of CERCLA.

Figure 1
Range of NRDA Methods

Simple/Cheap Complex/Expensive 		
Type A Computer Model	Benefit Transfer	Hedonic Analysis
NOAA Formulas	Appraisal Method	Travel Cost Analysis
	Factor Income	Averting Behavior Analysis
	Market Price Analysis	Contingent Valuation
	Habitat Equivalency Analysis	Conjoint Analysis

Source : Ando and Khanna (2002)

valuation needs to be designed carefully to estimate non-use values. Figure 1 illustrates this complexity range. The costs of these methods vary greatly, and are positively correlated with their complexity. The cost of a simplified method (such as a formula or table) could be as low as a several hundred dollars, while a complex damage assessment could cost millions of dollars (Ando and Khanna, 2002).

III. From NRD to Restoration

Once NRDA is completed, the trustees may recover the assessed damages and the costs of assessing damages^{4/} from the RPs by choosing to sue the RPs in court, negotiate with them for a settlement or file a claim with the Trust Fund in case a PRP cannot be found. The Trust Fund will sponsor restoration activities for cases in

which PRPs cannot be found. Often are cases settled by parties prior to trial as exemplified by the Lake Barre oil spill in Louisiana and the Contship Houston vessel grounding in Florida.^{5/} In other cases, RPs agree to settle during the trial period. Settlement may come quickly. For example, in the case of sanctuary damage to the Florida Key, the Coastal Marine Towing Company (co-defendant with the Great Lakes Dredges and Dock Company) settled on the first day of trial.^{6/} Alternatively, settlement may only follow a prolonged period of litigation such as that of Montrose Chemical Corporation, which finally settled claims for chronic discharges of DDT and PCBs along the California coastline after 10 years of legal wrangling.^{7/}

Typically, when deposition is underway or complete, the RPs have a greater incentive

^{4/} The reimbursement on the costs of assessing damages cannot exceed the amount of the estimated damages.

^{5/} www.darcnw.noaa.gov

^{6/} <http://www.olemiss.edu/orgs/SGLC/21.3sanctuary.htm>

^{7/} <http://www.darp.noaa.gov/southwest/montrose>

to settle. For bigger cases, the RPs might try to delay or avoid settlement via litigation. However, the RPs will usually settle once they determine that there is little value in continuing with the litigation process. Litigation is, however, a very costly and time-consuming process. For example, the average cost of a testifying expert is around \$70,000 for three day's work (Corner and Gouguet, 2004). The litigation process itself can last several years. Even after a court hands down its ruling, parties can appeal and counter-appeal and this process can last more than a decade. In general, the RPs do not have to pay for damages and restoration during the litigation process.

To avoid the unnecessarily prolonged negotiation, in recent years, there is a movement toward the cooperative damage assessment. The cooperative assessment project (CAP) is intended to promote greater participation between trustees and PRPs in settling liability issues and in prompt restoration of natural resource (NOAA, 2005). Moreover, there has been a recent shift from a damage-assessment-based approach to a restoration-based approach. That is, re-sources from both parties will be invested in working together on restoration plans rather than quantifying the exact damages in preparing for litigation. The PRPs' incentives to form a joint effort with the trustees may include reduction in transaction costs, enhancement of certainty on objective, scope, budget and outcome of the case, a desire to reach closure in a timely fashion, and positive recognition from the public. Examples of these cooperative assessment projects are the Upper Arkansas Rive Basin mining site,

Point Pedernales Pipeline spill, and Lavaca bay aluminum facility (NOAA, 2005).

IV. Application of the United States Experience to Thailand

It is reasonable to accept the "polluter pays" principle and analyze this direction. Those who cause pollution or damages to the environment and natural resources should be held liable for the costs of removing contaminants, restoring the resources and providing compensation to those who have been adversely affected. Currently in Thailand, according to the Enhancement and Conservation of National Environmental Quality Act, B.E. 2535, we have adopted the polluter pays principle. In Section 6, Article 96 and 97 briefly states the civil liability of the polluters. In practice, however, the stringency of this principle is not carried out.

In the age of hi-tech and digital industries, hazardous waste will soon threaten the environment and the health of our people. There are several activities that might improve social welfare on both the legal foundation and human resource sides. First, we require a law that is similar to CERCLA or OPA which explicitly focuses on liability, in order to provide a reasonable legal framework. Such legislation must indicate the officials in charge and their scope or guideline of responsibility. Moreover, it has to provide the tasks of the PRPs in the events of NRDs, and help to determine subsequent liability. Most importantly, there should be a strict and consistent enforcement regime or else any such law will prove itself to be a waste of re-

sources. Second, on the human resource side, we need (1) environmental scientists qualified to evaluate the physical injuries of the environment and impacts on human population, (2) economists equipped with the knowledge of assessing the extent of the injuries and (3) environmental judges and lawyers who prepare for litigation and provide judicial expertise in the event that settlement bargaining or cooperation is not achieved.

In such a scenario, public support is the key factor in successfully obtaining environ-

mental justice. It is important that information on environmental disaster be disseminated in the society. People need to be aware of such incidents and understand their entitlement as a society to a clean and safe environment. Moreover, the course of actions undertaken toward acquiring compensation from RPs and restoration of resources should be done carefully and transparently. In an already difficult situation, it is imperative that such procedures be devoid of further corruption.

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