

§ 11.70

40 CFR 61.14, and as may be applicable to the determination of injury to air resources.

(4) In selecting methods for testing and sampling for injury to air resources, the following performance factors of the sampling and analysis methods and the influencing characteristics of the assessment area and the general vicinity shall be considered:

- (i) Method detection limits, accuracy, precision, specificity, interferences, and analysis of time and cost;
- (ii) Sampling area locations and frequency, duration of sampling, and chemical stability of emissions; and
- (iii) Meteorological parameters that influence the transport of emissions and the spatial and temporal variation in concentration.

(e) *Geologic resources.* (1) Testing and sampling for injury to geologic resources shall be performed using methodologies described in this paragraph.

(2) Testing pH level in soils shall be performed using standard pH measurement techniques, taking into account the nature and type of organic and inorganic constituents that contribute to soil acidity; the soil/solution ratio; salt or electrolytic content; the carbon dioxide content; and errors associated with equipment standardization and liquid junction potentials.

(3) Salinity shall be tested by measuring the electrical conductivity of the saturation extraction of the soil.

(4) Soil microbial respiration shall be tested by measuring uptake of oxygen or release of carbon dioxide by bacterial, fungal, algal, and protozoan cells in the soil. These tests may be made in the laboratory or in situ.

(5) Microbial populations shall be tested using microscopic counting, soil fumigation, glucose response, or adenylate energy charge.

(6) Phytotoxicity shall be tested by conducting tests of seed germination, seedling growth, root elongation, plant uptake, or soil-core microcosms.

(7) Injury to mineral resources shall be determined by describing restrictions on access, development, or use of the resource as a result of the oil or hazardous substance. Any appropriate health and safety considerations that led to the restrictions should be documented.

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(f) *Biological resources.* (1) Testing and sampling for injury to biological resources shall be performed using methodologies provided for in this paragraph.

(2)(i) Testing may be performed for biological responses that have satisfied the acceptance criteria of § 11.62(f)(2) of this part.

(ii) Testing methodologies that have been documented and are applicable to the biological response being tested may be used.

(3) Injury to biological resources, as such injury is defined in § 11.62(f)(1)(ii) of this part, may be determined by using methods acceptable to or used by the Food and Drug Administration or the appropriate State health agency in determining the levels defined in that paragraph.

§ 11.70 Quantification phase—general.

(a) *Requirement.* (1) Upon completing the Injury Determination phase, the authorized official shall quantify for each resource determined to be injured and for which damages will be sought, the effect of the discharge or release in terms of the reduction from the baseline condition in the quantity and quality of services, as the phrase is used in this part, provided by the injured resource using the guidance provided in the Quantification phase of this part.

(2) The Quantification phase consists of § 11.70—general; § 11.71—service reduction quantification; § 11.72—baseline services determination; and § 11.73—resource recoverability analysis, of this part.

(b) *Purpose.* The purpose of the Quantification phase is to quantify the effects of the discharge or release on the injured natural resources for use in determining the appropriate amount of compensation.

(c) *Steps in the Quantification phase.* In the Quantification phase, the extent of the injury shall be measured, the baseline condition of the injured resource shall be estimated, the baseline services shall be identified, the recoverability of the injured resource shall be determined, and the reduction in services that resulted from the discharge or release shall be estimated.

(d) *Completion of Quantification phase.* Upon completing the Quantification phase, the authorized official shall make a determination as to the reduction in services that resulted from the discharge or release. This Quantification Determination shall be used in the Damage Determination phase and shall be maintained as part of the Report of Assessment described in § 11.90 of this part.

§ 11.71 Quantification phase—service reduction quantification.

(a) *Requirements.* (1) The authorized official shall quantify the effects of a discharge of oil or release of a hazardous substance by determining the extent to which natural resource services have been reduced as a result of the injuries determined in the Injury Determination phase of the assessment.

(2) This determination of the reduction in services will be used in the Damage Determination phase of the assessment.

(3) Quantification will be done only for resources for which damages will be sought.

(b) *Steps.* Except as provided in § 11.71(f) of this part, the following steps are necessary to quantify the effects:

(1) Measure the extent to which the injury demonstrated in the Injury Determination phase has occurred in the assessment area;

(2) Measure the extent to which the injured resource differs from baseline conditions, as described in § 11.72 of this part, to determine the change attributable to the discharge or release;

(3) Determine the services normally produced by the injured resource, which are considered the baseline services or the without-a-discharge-or-release condition as described in § 11.72 of this part;

(4) Identify interdependent services to avoid double counting in the Damage Determination phase and to discover significant secondary services that may have been disrupted by the injury; and

(5) Measure the disruption of services resulting from the discharge or release, which is considered the change in serv-

ices or the with-a-discharge-or-release condition.

(c) *Contents of the quantification.* The following factors should be included in the quantification of the effects of the discharge or release on the injured resource:

(1) Total area, volume, or numbers affected of the resource in question;

(2) Degree to which the resource is affected, including consideration of subunits or subareas of the resource, as appropriate;

(3) Ability of the resource to recover, expressed as the time required for restoration of baseline services as described in § 11.73 of this part;

(4) Proportion of the available resource affected in the area;

(5) Services normally provided by the resource that have been reduced as a result of the discharge or release; and

(6) Factors identified in the specific guidance in paragraphs (h), (i), (j), (k), and (l) of this section dealing with the different kinds of natural resources.

(d) *Selection of resources, services, and methodologies.* Specific resources or services to quantify and the methodology for doing so should be selected based upon the following factors:

(1) Degree to which a particular resource or service is affected by the discharge or release;

(2) Degree to which a given resource or service can be used to represent a broad range of related resources or services;

(3) Consistency of the measurement with the requirements of the economic methodology to be used;

(4) Technical feasibility, as that phrase is used in this part, of quantifying changes in a given resource or service at reasonable cost; and

(5) Preliminary estimates of services at the assessment area and control area based on resource inventory techniques.

(e) *Services.* In quantifying changes in natural resource services, the functions provided in the cases of both with- and without-a-discharge-or-release shall be compared. For the purposes of this part, services include provision of habitat, food and other needs of biological resources, recreation, other products or services used by humans, flood control,