The New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program

Guidance for the Sampling and Analysis of Concrete Designated for Recycling

(Updated February 20, 2007)

I. Overview:

The New Jersey Department of Environmental Protection (Department or NJDEP) is requiring the characterization, preferably by in situ predemolition sampling, or post-demolition sampling, by analysis of concrete and post-demolition concrete-processing fines at all New Jersey demolition and construction sites that have the Department's Site Remediation and Waste Management Program's (SRWMP) oversight at a contaminated site when the concrete is designated for: 1) recycling pursuant to N.J.A.C. 7:26A *et seq.*; or, 2) beneficial use pursuant to N.J.A.C. 7:26-1.7(g), rather than disposal as solid waste. This characterization requirement applies to demolished buildings, concrete roadways and related structures such as, but not limited to, sidewalks and curbing. The Department is taking this step to ensure that the concrete entering the State's concrete recycling system is clean and will not contaminate otherwise clean sites.

The Sampling and Analysis Protocol outlined below is for certain contaminants that the Department recognizes may be found in concrete from contaminated sites. Only uncontaminated concrete will normally qualify for unrestricted recycling, while some minimally contaminated concrete or concrete fines may qualify for beneficial uses but only with Department approval.

For example, asphalt-contaminated concrete or concrete mixed with soils may meet beneficial use requirements for certain conditional uses at roadways. No sampling of the concrete from a site is required under this guidance if the property owner chooses to dispose of all of the material as solid waste. Note that Department approval pursuant to N.J.A.C. 7:26-1.7(g)8 is required for the beneficial use of materials out of state, which may require sampling and analysis of the material to meet the receiving State's requirements.

II. Concrete Materials Characterization:

Through either in situ, which is the preferred approach, or post demolition sampling the site owner is responsible for characterizing the concrete in the structures the owner is demolishing. In situ sampling and analysis is sampling prior to demolition at targeted areas of the structure, which are known and suspected areas of contamination, in order to determine contamination levels. More detailed information concerning in situ sampling requirements is described in Section V below.

Alternatively, the owner may elect to conduct post-demolition sampling and analysis of the concrete from a structure or consolidation of concrete from roadway and related structures. The concrete material must be stockpiled on the property where it is generated if it is to be considered for either recycling or beneficial use. The material should be staged in

Sampling Areas of segregated material based on any knowledge of contamination and sampled according to the Sampling and Analysis Protocol below in Section V. Otherwise the concrete must be managed as solid waste per the solid waste regulatory requirements at N.J.A.C. 7:26 *et seq*. All sampling must take place where the material is generated in accordance with the Department's Technical Requirements for Site Remediation at N.J.A.C. 7:26E, including the Field Sampling Procedures Manual.

III. Criteria for Materials Disposition:

The disposition of all concrete material from contaminated sites with the Department's SRWMP's oversight at contaminated sites shall be determined by characterization of the material using the results of sampling and analysis conducted according to this guidance. The analytical results shall be compared to the Department's most recent Soil Cleanup Criteria (SCC), which are publicly available at the following website: http://www.state.nj.us/dep/srp/regs/scc/index.html . Data averaging is not permitted in order to achieve compliance with the criteria.

For material that is intended to be used on the site of generation sampling and management of material must be conducted in compliance with the requirements of the Department's case manager.

Concrete materials containing contamination entirely below the Department's Residential Direct Contact Soil Cleanup Criteria (RDCSCC) shall be considered eligible for transfer: 1) to a Class B Recycling Center holding a General or Limited Approval for recycling, 2) for recycling per the recycling site approval exemption requirements at N.J.A.C. 7:26A-1.4(a)2, 7, or 20, or 3) for direct unrestricted use on or off site in compliance with all other requirements. Compliance with any Federal, State, and local requirements is still required for all uses of concrete materials.

Materials containing any contaminant above the Department's RDCSCC are considered solid wastes and must be managed in accordance with all statutory and Department regulatory requirements including, but not limited to, the full requirements for solid waste pursuant to the Solid Waste Regulations at N.J.A.C. 7:26 *et seq*. including classification as hazardous waste as necessary, or at specific Class B recycling centers authorized to accept the material, or beneficial use in accordance with Department requirements. Department guidance for conducting Beneficial Use Projects and a project application form are available at http://www.state.nj.us/dep/dshw/rrtp/bud.htm .These contaminated materials do not qualify for the following: 1) recycling at the State's Class B, or other, Recycling Centers holding a General Approval or at Class B Limited Recycling Centers approved in accordance with the requirements at N.J.A.C. 7:26A-3.7 unless the facilities are specifically authorized to accept the material; 2) recycling at sites operating per the recycling approval exemption requirements at N.J.A.C. 7:26A-1.4(a)2, 7, or 20; and, 3) for direct reuse or recycling on or off of the site of generation without Department approval.

IV. Separation of Distinct Demolition Areas and Materials:

The sampling and analysis protocol specified in this document in Section V is based on defining distinct areas of the structure for initial in situ sampling or demolition based on known and suspected areas of contamination within or on a structure, roadway or pad or any other "area of concern". Demolition shall be planned to prevent the mixing of areas of demolition that are contaminated with uncontaminated areas in the form of a demolition workplan. The site owner is obligated to develop and implement a plan to segregate contaminated materials from uncontaminated materials. Demolition practices should separate out materials that may be contaminated prior to and/or concurrent with demolition, for proper manifesting and/or disposal as solid waste.

V. Sampling and Analysis:

1. **What Demolition Materials to Sample:** Source Separated Concrete, Block, Brick and Concrete Fines (processed concrete fines or concrete mixed with soil, sand, stone, etc.) at all New Jersey demolition and construction sites that have the Department's Site Remediation Program's oversight at a contaminated site.

2. **How to Sample**:
   a. **Biased Sampling**: All sampling, including in situ sampling, shall be biased toward visible staining or other indication of potential contamination: such as the source of the material, coloration or odor.

   b. **Sampling Methods:** the Department is specifying approved sampling methods as either chip or core samples. Core samples shall be no deeper than 1 inch unless staining or discoloration indicates that contamination is below that depth. Sampling logs shall record the depth of core samples. This would further support the Self Certification Process mentioned previously. Confirmatory sampling is required of material intended for recycling if suspected contaminated sections of material are removed.

   c. **Sampling Areas**: Sampling areas shall be determined based on each distinct area of demolition such as separate properties, separate structures on the same property, known or suspected areas of contamination within a structure or roadway, or designated Areas of Concern (AOC). The Department case manager may be consulted as an option for advice, or a determination, of which structures to sample.

      Sampling Frequency: In situ sampling frequency is dependent on the number of areas of biased sampling and whether contamination is found at sampling locations. Material used for samples shall not exceed 1 (one) inch maximum in depth. If additional material is needed for a sample additional sample(s) should be colocated at the sampling point. In situ samples shall always be discrete samples and not composited.

      Each post-demolition Sampling Area, such as accumulated concrete material in individual staged stockpiles, shall be sampled at the following rate. Material

used for individual samples shall not exceed 1 (one) inch maximum in size, and depth. If additional material is needed for a sample additional sample(s) should be colocated at the sampling point.

(Each composite sample must include 1 sample for each 20 yds^3.)

Quantity		**Number of Composite Samples**
Less than 400 yds^3	-	1/100 total yds^3
400 yds^3 – 2000 yds^3	-	1/200 total yds^3 + 2
Over 2000 yds^3	-	1/500 total yds^3 + 8

(Ex. 1: 310 total yds^3 project requires: (310/100) = 4 samples.)
(Ex. 2: 735 total yds^3 project requires: (735/200) + 2 = 6 samples.)
(Ex. 3: 1,750 total yds^3 project requires: (1750/200) + 2 = 11 samples.)
(Ex. 4: 5,000 total yds^3 project requires: (5000/500) + 8 = 18 samples.)

(Note: for any amount over a volume increment round up to the next highest number of samples as in ex. 1 and 2.)

3. What Contaminants to Analyze: (Analysis Profile)

All sampling and sample analyses shall be conducted in accordance with the criteria and methods specified in the Technical Requirements for Site Remediation at N.J.A.C. 7:26E *et seq*. The Department sanctions composite sampling for the purposes of post-demolition materials characterized for management per this guidance. In situ samples shall always be discrete samples and not composited.

For all sites:

a. **PCBs & PAHs**: **:**

Sample and analyze in all concrete and concrete fine materials. If the recycled concrete is going to be used as road base, the requirement to analyze for PAHs may be eliminated by the site case manager.

Based on site-specific factors, or as directed by the Department Case Manager:

b. **TCLP, TAL/TCL+30, TPH:**

If known or suspected at industrial, mining or other sites, or as directed by the Department's Case Manager for the site, analyze for VOCs, SVOCs, TCLP Pesticides, Herbicides; TAL/TCL+30, TPH, and as required on a case-specific basis RCRA TCLP including TCLP metals.

c. **Dioxins/Furans**:

If known or suspected at industrial, mining or other sites, or as directed by the Department's Case Manager for the site, use USEPA Method 1613B, 1ppt detection limit, 17-congener profile, or the latest Department-approved method. Consult the Department for a case-specific determination for use of materials containing elevated levels of dioxins/furans above a screening level of 50 parts per trillion (ppt) total 17-congener Toxicity Equivalents (TEQ) off site.

d. **Radionuclides as** Naturally Occurring Radioactive Material (NORM):

If known or suspected at industrial, mining or other sites, or as directed by the Department's Case Manager for the site, analyze by gamma spectroscopy for

the natural series of radionuclides. The representative samples should be dried, sealed and counted after 21 days. The minimum detectable concentration requirement for Ra-226 and Th-232 daughter nuclides should be 0.5 picoCuries per gram (pCi/g) on dried material. Provide laboratory documentation of analysis and methodology. The laboratories must be certified by the Department's Office of Quality Assurance (OQA) for radionuclides in soil analysis DOE 4.5.2.3. Contact Mr. Vas Komanduri of OQA at (609)984-0855 for a current list of certified laboratories.

The following industries are recognized by the Department's Bureau of Environmental Radiation as having the potential to have technologically enhanced Naturally Occurring Radioactive Material (NORM) contamination potential: Paper and pulp facilities; Ceramics manufacturing; Paint and pigment manufacturing; Metal foundry facilities; Optical glass; Fertilizer plants; Aircraft manufacture; Munitions and armament manufacture; Scrap metal recycling; Zirconium manufacturing; Oil and gas production, refining, and storage; Electricity generation; Cement and concrete product manufacture; Radiopharmaceutical manufacturing; Geothermal energy production.

VI. Self-certification Compliance:

The Department will allow the owner of a site that is a demolition and construction site with the Department's SRWMP's oversight that is required to comply with this guidance, to self certify the site, or a portion or portions of the sites' structures, as clean based on the results of in situ or post-demolition sampling and analysis prior to concrete material disposition per this guidance document. The certification specifies that all of the concrete and concrete materials contain contamination of PCBs and PAHs, and other contaminants based on site specific factors or as directed by the Department's Case Manager, below the Department's Soil Cleanup Criteria. The site owner shall base the self certification on analytical data from the testing of the concrete in accordance with this guidance and certify that the concrete was fully characterized and also managed according to the requirements of this guidance. The owner of the site is responsible for compliance with this guidance, maintaining all documentation related to the demolition and material characterization process including demolition and sampling plans, analytical testing documentation and material disposition after self certification and filing self certification documents with the Department.

The owner of the property where the concrete sampling was conducted shall complete the certification on the following pages, which the owner shall have notarized and retain with the characterization documentation. The owner of the property is responsible for submitting a copy of the executed certification to the Department's SRWMP Case Manager for the site.

The person completing the certification must be a principal executive officer, general partner or proprietor of the company or a high level official of a government-owned site. The site owner has the option of providing a delegation of authority, which assigns responsibility for signing the Self Certification Statement from the officer or high ranking official to the local site manager, to the Department with the Certification Statement.

The New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program

CERTIFICATION STATEMENT FOR CONCRETE DESIGNATED FOR RECYCLING

"I certify under penalty of law that I have personally examined and am familiar with the information related to this material characterization documentation concerning the self-certification of the site named herein and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, complete and meets the requirements of the latest, "Guidance for the Sampling and Analysis of Concrete Designated for Recycling" issued by the New Jersey Department of Environmental Protection that all of the concrete and concrete materials contain contamination of PCBs and PAHs, and other contaminants as directed by the Department's Case Manager, below the Department's Soil Cleanup Criteria. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I understand that, in addition to criminal penalties, I may be liable for a civil administrative penalty pursuant to N.J.A.C. 7:26-5 and that submitting false information may be grounds for denial, revocation or termination of any solid waste facility permit, vehicle registration or other Department authorization for which I may be seeking approval or now hold."

NAME OF SITE

_____

ADDRESS

_____

CITY, STATE & ZIP CODE

_____

NAME OF CERTIFYING PERSON (Must be a corporate officer) **TITLE**

_____

SIGNATURE OF CERTIFYING PERSON (Must be a corporate officer) **DATE**

_____

TELEPHONE **FAX**

_____

INTERNET WEBSITE **EMAIL**

_____

IMPORTANT

Pursuant to N.J.S.A. 47:lA-1 et seq. the information provided in this form and its attachments shall be available to the public for review unless a specific claim of confidentiality is submitted pursuant to the procedures set forth in N.J.A.C. 7:26-17 et seq. and is approved by the Department. For assistance regarding confidentiality claims, please contact the Solid and Hazardous Waste Program at (609) 984-6985.

SIGNATURES. IN WITNESS WHEREOF, Owner has executed this Certification of Concrete Sampling as of the date first written above.

[If Owner is an individual]

WITNESS:

_____ _____
[Signature] [Print name below signature]

[If Owner is a corporation]

ATTEST: [Name of corporation]

_____ By_____

_____ _____
[Print name and title] [Signature]

[If Owner is a general or limited partnership]

WITNESS: [Name of partnership]

_____

_____ By_____, General
[Signature] [Print name] Partner

[If Owner is an individual]

STATE OF [State where document is executed] SS.:
COUNTY OF [County where document is executed]

I certify that on _____, 20__, [Name of Owner] personally came before me, and this person acknowledged under oath, to my satisfaction, that this person [or if more than one person, each person]

(a) is named in and personally signed this document; and

(b) signed, sealed and delivered this document as his or her act and deed.

_____

_____, Notary Public
[Print Name and Title]

[If Owner is a corporation]

STATE OF [State where document is executed] SS.:
COUNTY OF [County where document is executed]

I certify that on _____, 20__, [Name of person executing document on behalf of Owner] personally came before me, and this person acknowledged under oath, to my satisfaction, that:

(a) this person is the [secretary/assistant secretary] of [Owner], the corporation named in this document;

(b) this person is the attesting witness to the signing of this document by the proper corporate officer who is the [president/vice president] of the corporation;

(c) this document was signed and delivered by the corporation as its voluntary act and was duly authorized;

(d) this person knows the proper seal of the corporation which was affixed to this document; and

(e) this person signed this proof to attest to the truth of these facts.

_____
[Signature]

_____
[Print name and title of attesting witness]

Signed and sworn before me on _____, 20__

_____, Notary Public

_____
[Print name and title]

[If Owner is a partnership]

STATE OF [State where document is executed] SS.:
COUNTY OF [County where document is executed]

I certify that on _____, 20__, [Name of person executing document on behalf of Owner] personally came before me, and this person acknowledged under oath, to my satisfaction, that this person:

(a) is a general partner of [Owner], the partnership named in this document;

(b) signed, sealed and delivered this document as his or her act and deed in his capacity as a general partner of [owner]; and

(c) this document was signed and delivered by such partnership as its voluntary act, duly authorized.

_____
[Signature]

_____, General Partner
[Print Name]

_____, Notary Public

_____
[Print name and title]