Checklist to Determine Applicable Remediation Standards
Part 1: Ecological Standards

STEP 1: Determine Whether a De Minimis Ecological Screening Evaluation is Appropriate for the Site		
1.1	Are there any undeveloped terrestrial areas on or adjacent to the site (e.g., areas that are not under intensive landscape or agricultural control)?	☐ Yes ☐ No
1.2	Are there any potential wetlands (including vernal pools) on or adjacent to the site?	☐ Yes ☐ No
1.3	Are there any surface water bodies (i.e., lotic or lentic habitat) on or adjacent to the site?	☐ Yes ☐ No
1.4	Are there any terrestrial, wetland, or aquatic habitats off-site, but situated downstream, downwind, or downgradient from the site that may be affected by site-related stressors?	☐ Yes ☐ No
1.5	Are there any projected land uses for the site that would result in undeveloped areas, wetland habitat, lotic habitat, or lentic habitat?	☐ Yes ☐ No
If "Yes" to any: A complete exposure pathway may exist for potential ecological receptors of concern. Proceed to Step 2. *If "No" to all: No further ecological evaluation is required. File this completed form with the Site Assessment Report.*		

STEP 2: Identify any Readily Apparent Harm or Exceedances of Surface Water Quality Standards		
2.1	Have there been any incidents where harm to wildlife attributable to contaminants originating from the site has been readily apparent?	☐ Yes ☐ No
	If "Yes": Proceed to Question 2.2. *If "No": Skip to Question 2.3.*	
2.2	Has the cause of such harm been eliminated?	☐ Yes ☐ No
	If "Yes": Briefly describe the action taken and complete the rest of the checklist. *If "No": Proceed directly to the remedy evaluation or, alternately, proceed with a determination of a Uniform or Site-Specific Ecological Standard, as described in the VRP Guidance Manual, prior to implementation of the remedy. File this form with the Site Assessment Report.*	
	Action Taken:	
2.3	Is the site contributing to exceedances of surface water quality standards established for the protection of aquatic life (see W. Va. Legislative Rule 47CSR2)?	☐ Yes ☐ No ☐ Unknown
	If "Yes": Proceed directly to the remedy evaluation or, alternately, proceed with a determination of a Uniform or Site-Specific Ecological Standard, as described in the VRP Guidance Manual, prior to implementation of the remedy. *If "No" or "Unknown": Proceed to Step 3.*	

STEP 3: Identify Contamination Associated with Ecological Habitats		
3.1	Have the environmental media (e.g., soil, surface water, sediment, biota) associated with the ecological habitat(s) identified in Questions 1.2 through 1.5 been sampled and analyzed with regard to potential site-related contaminants of concern?	☐ Yes ☐ No
	If "Yes": Proceed to Question 3.2. *If "No": Skip to Step 4.*	
	Comments (e.g., some media sampled but others not, limitations of data):	
3.2	Have any site-related contaminants been detected above natural background concentrations in environmental media collected from terrestrial habitat?	☐ Yes ☐ No ☐ Unknown ☐ n/a
	Comments (e.g., type of contaminants):	
3.3	Have any site-related contaminants been detected above natural background concentrations in environmental media collected from wetland or aquatic habitats (lotic or lentic habitats)?	☐ Yes ☐ No ☐ Unknown ☐ n/a
	If "Yes" or "Unknown" to 3.2 and/or 3.3: Proceed to Question 3.4. *If "No" or "n/a" to both 3.2 and 3.3: Skip to Question 3.6.*	
	Comments (e.g., wetland or aquatic, lotic or lentic, limitations of data):	
3.4	Are site-related contaminants presenting an ecological risk over and above "local" condition?	☐ Yes ☐ No ☐ Unknown
	If "Yes": Skip to Step 4. *If "No" or "Unknown": Proceed to Question 3.5.*	
	Comments (e.g., evidence of local condition and/or ecological risk):	
3.5	Have site-related releases of contaminants been stopped?	☐ Yes ☐ No
	If "Yes": Proceed to Question 3.6. *If "No": Skip to Part 4.*	
	Comments (e.g., how were releases stopped):	
3.6	Are site-related contaminants currently or likely to be migrating to aquatic habitat (e.g., lotic, lentic, or wetland habitat)?	☐ Yes ☐ No ☐ Unknown ☐ n/a
	If "Yes" or "Unknown": Proceed to Step 4. *If "No" or "n/a": No further ecological evaluation is required. File this completed form with the Site Assessment Report.*	

STEP 4: Characterize the Potential Ecological Habitat		
4.1	Describe the general land use in the immediate vicinity of the site.	
	☐ Commercial/Industrial ☐ Residential ☐ Rural/Agricultural ☐ Rural/Undeveloped ☐ Urban ☐ Other:	
4.2	For all affected areas that fulfill the descriptions in Step 1, answer the following and attach a site map identifying the potential ecological habitat.	
	4.2.1 Outline characteristics for potential terrestrial habitats.	
	Location:	
	Contiguous Area:	
	General Topography:	
	Primary Soil Type:	
	Predominant Vegetation Species:	
	4.2.2 Outline characteristics for potential wetland habitats (e.g., vernal pools, marshes, etc.).	
	Location:	
	Contiguous Area:	
	General Topography:	
	Primary Soil Type:	
	Predominant Vegetation Species:	
	4.2.3 Outline characteristics for potential lotic habitats (flowing water).	
	Location:	
	Typical Width and Depth:	
	Typical Flow Rate:	
	Typical Gradient (m/km):	
	Type of River/Creek Bottom:	
	Types of Aquatic Vegetation Present:	
	Topography of the Riparian Zone:	
	Predominant Riparian Vegetation:	
	Human Utilization of Lotic Habitat:	
	Local Conditions:	
	4.2.4 Outline characteristics for potential lentic habitats (standing water).	
	Location:	
	Is the lentic habitat…?	☐ Natural ☐ Man-made
	Area of Lentic Habitat	
	Typical and Maximum Depth:	
	Description of Sources & Drainage:	
	Predominant Aquatic Vegetation:	
	Topography of Littoral Zone:	
	Predominant Littoral Zone Vegetation:	
	Human Utilization of Lentic Habitat:	
	Local Conditions:	

4.3	Indicate if the site contains or is adjacent to any of the following types of valued terrestrial habitats:	
	☐ Climax Community (e.g., old growth forest) ☐ Federal Wilderness Area (designated or administratively proposed) ☐ National or State Forest ☐ National or State Park ☐ National or State Wildlife Refuge ☐ National Preserve Area ☐ State designated natural area ☐ Federal land designated for protection of natural ecosystems ☐ Federal or State land designated for wildlife or game management ☐ Area utilized for breeding by large or dense aggregations of wildlife ☐ Feeding, breeding, nesting, cover, or wintering habitat for migratory birds ☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) *Threatened or Endangered Species* ☐ Critical habitat for federally designated threatened or endangered species ☐ Habitat known to be used or potentially used by Federal or State designated threatened or endangered species, or species in the State Wildlife Action Plan	
4.4	Indicate if the site contains or is adjacent to any of the following types of valued wetlands:	
	☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) ☐ Area utilized for breeding by large or dense aggregations of wildlife ☐ Spawning or nursery areas critical to the maintenance of fish/shellfish species ☐ Feeding, breeding, nesting, cover, or wintering habitat for migratory waterfowl or other aquatic birds ☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) *Threatened or Endangered Species* ☐ Critical habitat for federally designated threatened or endangered species ☐ Habitat known to be used or potentially used by Federal or State designated threatened or endangered species, or species in the State Wildlife Action Plan	
4.5	Indicate if the site is within or adjacent to any of the following valued aquatic habitats:	
	☐ Federal or State Fish Hatchery ☐ Federal or State designated Scenic or Wild River ☐ National River Reach designated as recreational ☐ Critical areas identified under the Clean Lakes Program ☐ Trout-stocked streams or wild trout streams with verified trout production ☐ Spawning or nursery areas critical to the maintenance of fish/shellfish species ☐ Feeding, breeding, nesting, cover, or wintering habitat for migratory waterfowl or other aquatic birds ☐ Area important to the maintenance of unique biotic communities (e.g., high proportion of endemic species) *Threatened or Endangered Species* ☐ Critical habitat for federally designated threatened or endangered species ☐ Habitat known to be used or potentially used by Federal or State designated threatened or endangered species, or species in the State Wildlife Action Plan	
4.6	Have valued terrestrial, wetland, or aquatic habitats been identified within or adjacent to this site? *(A list of agencies that can provide information that should assist in determining whether the site is located within or adjacent to the areas listed in 4.3, 4.4, and 4.5 is provided at the end of this checklist.)*	☐ Yes ☐ No

STEP 5: Identify Any Potential Ecological Receptors of Concern		
5.1	Threatened and Endangered Species Were any habitats within or adjacent to the site identified as critical habitat for, or areas known to be used by, federally threatened or endangered species listed in 50CFS17.95 or 17.96?	☐ Yes ☐ No

If "Yes", indicate which species*:

Amphibians
- ☐ Cheat Mountain salamander (*Plethodon nettingi*)

Clams & Mussels
- ☐ Clubshell (*Pleurobema clava*)
- ☐ Fanshell (*Cyprogenia stegaria*)
- ☐ James spinymussel (*Pleurobema collina*)
- ☐ Longsolid (*Fusconaia subrotunda*)
- ☐ Northern riffleshell (*Epioblasma torulosa rangiana*)
- ☐ Pink mucket pearlymussel (*Lampsilis abrupta*)
- ☐ Purple cat's paw pearlymussel (*Epioblasma obliquata obliquata*)
- ☐ Rayed bean (*Villosa fabalis*)
- ☐ Round hickorynut (*Obovaria subrotunda*)
- ☐ Sheepnose (*Plethobasus cyphyus*)
- ☐ Snuffbox (*Epioblasma triquetra*)
- ☐ Spectablecase (*Cumberlandia monodonta*)
- ☐ Tubercled blossom pearlymussel (*Epioblasma torulosa torulosa*)

Fish
- ☐ Candy darter (*Etheostoma osburni*)
- ☐ Diamond darter (*Crystallaria cincotta*)

Flowering Plants
- ☐ Harperella (*Ptilimnium nodosum*)
- ☐ Northeastern bulrush (*Scirpus ancistrochaetus*)
- ☐ Running buffalo cover (*Trifolium stoloniferum*)
- ☐ Shale barren rock cress (*Arabis perstellata*)
- ☐ Small whorled pogonia (*Isotria medeoloides*)
- ☐ Virginia spiraea (*Spiraea virginiana*)

Mammals
- ☐ Gray bat (*Myotis grisescens*)
- ☐ Indiana bat (*Myotis sodalis*)
- ☐ Northern long-eared bat (*Myotis septentrionalis*)
- ☐ Tricolored bat (*Perimyotis subflavus*) – Proposed Species as of 2022
- ☐ Virginia big-eared bat (*Corynorhinus towsendii virginianus*)
- ☐ Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*)

Snails & Invertebrates
- ☐ Big Sandy crayfish (*Cambarus callainus*)
- ☐ Flat-spired three-toothed land snail (*Triodopsis platysayoides*)
- ☐ Guyandotte River crayfish (*Cambarus veteranus*)
- ☐ Madison cave isopod (*Antrolana lira*)
- ☐ Monarch butterfly (*Danaus plexippus*) – Candidate Species as of 2020
- ☐ Rusty-patched bumble bee (*Bombus affinis*)

5.2	Local Populations Providing Important Natural or Economic Resources, Functions, and Values Were any valued terrestrial, wetland, or aquatic habitats listed in 4.3, 4.4, or 4.5 identified within or adjacent to the site?	☐ Yes ☐ No
If "Yes" to 5.1 and/or 5.2 and/or surface water bodies are not in compliance with applicable water quality standards: The site does not pass the De Minimis ecological risk screening, since a complete exposure pathway may exist for potential ecological receptors of concern. Further evaluation of the site is required using either the Uniform Ecological Standard or the Site-Specific Ecological Standard. *If "No" to 5.1 and 5.2 and surface water bodies are in compliance with applicable water quality standards: No further ecological evaluation is required. File this completed form with the Site Assessment Report.*		

*The list contains those federally designated threatened and endangered species that are indigenous to WV. WVDNR, Wildlife Resources Section should be consulted to ensure the list is correct. WV has not established a list of state designated threatened or endangered species; however, the WVDNR has developed a "Species of Greatest Conservation Need" list in the State Wildlife Action Plan. Species listed in the State Wildlife Action Plan should also be considered in any Ecological Risk Assessment.

Federal and State Agencies for Ecological Review Consultation

U.S. Department of Agricultural – Natural Resources and Conservation Service
1550 Earl L. Core Road, Suite 200
Morgantown, WV 26505
304-284-7540
https://www.nrcs.usda.gov/wps/portal/nrcs/site/wv/home

U.S. Fish and Wildlife Service – WV Field Office
Ecological Services
6263 Appalachian Highway
Davis, WV 26260
304-866-3858
https://www.fws.gov/office/west-virginia-ecological-services

WV Division of Forestry
7 Players Club Drive
Charleston, WV 25311
304-558-2788
https://wvforestry.com/

WV Division of Natural Resources
Building 74
324 Fourth Avenue
South Charleston, WV 25303
304-558-2754
http://www.wvdnr.gov/

WV Division of Natural Resources – Wildlife Resources Section
Building 74
324 Fourth Avenue
South Charleston, WV 25303
304-558-2771
http://www.wvdnr.gov/

Checklist to Determine Applicable Remediation Standards
Part 2: Human Health Standards

STEP 1: Determine Whether the De Minimis Standard is Appropriate for the Site

The De Minimis Standard applies to contaminants for which the primary exposure routes will be ingestion, dermal contact, and/or inhalation of soil or groundwater. For soil, the De Minimis Standard is either the risk-based concentration (RBC) (Table 60-9 of the Rule) or the natural background level of the contaminant, whichever is higher. The potential for vapor intrusion also needs to be screened by comparing site groundwater, soil gas, or indoor air concentrations to the relevant RBC in the USEPA Vapor Intrusion Screening Levels (VISL).

Evaluating a site based on the De Minimis Standard consists of aggregating site data and comparing the exposure point concentration (EPC), which is either maximum concentrations detected or the 95% upper confidence limit (UCL) concentration, to establish RBCs. If site EPCs do not exceed the RBC or site-specific background, then no further evaluation or remediation of the site is required. Similarly, if the site EPCs do exceed the RBC or site-specific background but presumptive remedies can be shown to sever the potential exposure route, then no further evaluation is needed, and the Applicant can proceed to implementing the presumptive remedies. (Completing Worksheet 4-1 at the end of this checklist may aid in this process.)

The De Minimis approach is limited to particular compounds and is appropriate only for residential or industrial exposure scenarios. Note that Recreator risks can be assessed in a De Minimis Risk Assessment using the methods outlined in Appendix C. Below are several questions that will help to determine whether a site may be evaluated under the De Minimis Standard.

1.1	Have media representing all potentially complete pathways in the conceptual site model been sampled?	☐ Yes ☐ No
1.2	Are there fewer than 10 chemicals present at the site?	☐ Yes ☐ No
1.3	If any concentration of chemicals of potential concern exceed the RBC, are there presumptive remedies that can sever the exposure pathways and that are acceptable to the Applicant and impacted off-site property owners?	☐ Yes ☐ No
1.4	Is the future use of the site expected to only be residential and/or industrial?	☐ Yes ☐ No
1.5	Does Part 1 (Ecological Standards) of this checklist indicate that there are no ecological receptors of concern at the site (e.g., wetlands or endangered species)?	☐ Yes ☐ No

If "Yes" to all: The De Minimis Standard is likely appropriate for the site.
If "No" to any: The De Minimis Standard may not be appropriate for the site, and more site-specific characterization may be needed; however, the Applicant may consult with WVVDEP to confirm the determination. Note that Recreator risks and Construction Worker risks can be assessed in a De Minimis Risk Assessment using the methods outlined in Appendix C and attaching the RSL Calculator Output, VURAM Output, or ALM spreadsheet, as appropriate.
If "No" to all: The De Minimis Standard is not appropriate for the site. The Uniform Standard or Site-Specific Standard should be considered instead.

STEP 2: Determine Whether the Uniform Standard is Appropriate for the Site

The Uniform Standard is based on the use of WVDEP-approved methodologies to calculate remediation standards. Advantages to using the Uniform Standard include the fact that this methodology can be used to determine remediation standards for some contaminants and receptors not included under the De Minimis Standards or De Minimis Risk Assessment process (e.g., recreators and construction workers), and that, with adequate documentation, site-specific information can be incorporated into the calculations. The disadvantages of the approach defined under the Uniform Standard are that exposure scenarios and potential exposure pathways included in these calculations are limited to those available in the USEPA Regional Screening Levels methodology.

Note that if site-specific modeling will be used in determining EPCs for media at a site, a site-specific risk assessment should be used.

2.1	Is future use of the site potentially other than residential or industrial use?	☐ Yes ☐ No
2.2	Do potentially impacted sediments exist at the site that should not be held to residential or industrial soil cleanup standards?	☐ Yes ☐ No
2.3	Do home vegetable gardens potentially exist in the vicinity of the site, and is homegrown produce potentially impacted by site-related chemicals?	☐ Yes ☐ No
2.4	Are there any dairy farms or livestock grazing areas within the area of impact of the site?	☐ Yes ☐ No
2.5	Is impacted groundwater or surface water used for irrigation or any use other than drinking water?	☐ Yes ☐ No
2.6	Are construction/utility workers potentially exposed to contaminated groundwater in a trench? (Note that this scenario can be covered in a De Minimis Risk Assessment using default exposure parameters in VURAM, but the Applicant/LRS may choose to use more site-specific information.)	☐ Yes ☐ No

If "Yes" to any: There are potential pathways for human exposure to site-related chemicals that are not addressed in the methodology provided for determining a Uniform Standard. Therefore, a Site-Specific Standard may be more appropriate for the site.
If "No" to all: The Uniform Standard is likely appropriate for the site.

Worksheet 4-1

If EPCs for all site contaminants are less than the corresponding RBC values, no remediation is required. If the site EPC values exceed the RBC values, additional assessment or remediation of the site is required.

Worksheet 4-1: Compare Site Data to Chemical Specific De Minimis RBC Values					
Soil (mg/kg)	**Contaminant**	**Max Concentration**	**UCL**	**RBCs Residential**	**Industrial**
Groundwater µg/L	**Contaminant**	**Max Concentration**	**UCL per well**	**RBCs Groundwater**	**Res VISL**
Soil Vapor µg/m^3	**Contaminant**	**Max Concentration**	**UCL per sample location (if ≤8 samples)**	**RBCs Residential**	**Industrial**

UCL = 95% Upper Confidence Level
RBC = Risk Based Concentrations provided in Table 60-9 of the Rule and in the USEPA Vapor Intrusion Screening Levels (VISL)