

## Details regarding the C&DD Facility Ground Water Evaluation – Priority Criteria

The following text provides an explanation of the scoring sheet entitled “*C&DD Facility Ground Water Evaluation – Priority Criteria*”. The priority criteria are listed in the order they appear in the scoring sheet, from higher to lower points.

- 1) Public Health Criteria: This priority criterion focuses on the potential threats to public health by evaluating whether the C&DD facility is located near existing public or private drinking water supply wells.
  - A. Source Water Assessment & Protection (SWAP) areas: these are locations within the 5-year time-of-travel (TOT) of a public water system well or wellfield. These public water systems have high pumping rates and provide drinking water to significant populations. The susceptibility rating is based largely on ODNR Pollution Potential (or DRASTIC) map scores. The higher the DRASTIC score, the more susceptible the aquifer/location combination is to contamination, and conversely, a lower DRASTIC score means less susceptibility to contamination. Thus, a C&DD facility located within a SWAP area of low susceptibility is scored lower than a C&DD facility located in a SWAP area of high susceptibility. Also, an extra 25 points are added if the C&DD facility is located within the 1-year TOT of the well or wellfield.
  - B. Within 500 feet of a SWAP area: a facility located just outside the SWAP area (i.e. within 500 feet of the SWAP area) still poses a threat to the well or wellfield, but less so than within the SWAP area. Just as in the SWAP area in 1A above, the scores in this field are based on susceptibility of the aquifer to contamination, but are lower than those within the SWAP area. \*If a facility is not located within a SWAP area and there are no private water supply wells within the criteria mentioned in 1C below, but a SWAP public water supply well does exist nearby, evaluate the SWAP public water supply well as a private well using the criteria in 1C below rather than that in 1B.
  - C. Distance from a private water supply well: proximity to located private water supply wells is also deemed a threat, albeit less of a threat than located within a SWAP area due to the smaller population served and significantly lower pumping rate of private wells vs. public wells. The scoring is likewise commensurate to the DRASTIC score particular to the aquifer/location combination. The DRASTIC score is based upon the susceptibility of the aquifer to contamination. The distances of the facility being 1000 feet upgradient and/or 500 feet downgradient of each private water supply well are consistent with OAC rule 3745-400-09(B)(7) and ORC 3714.03(C)(3).
- 2) Protection of Critical Drinking Water Resources: This priority criterion focuses exclusively on those locations over sole source aquifers. Sole Source Aquifer designation is given to an aquifer by US EPA because no other reasonable public water supply exists in that area and the cost to the public to replace the aquifer as a water supply source would be excessive. These aquifers, as in the case of much of the Great Miami Buried Valley sole source aquifer, serve large populations and their contamination can lead to public health issues. Sole source aquifers were given a high relative score due to their federal protection and value as a critical resource. Some differentiation in points assigned to the four designated sole

source aquifers in Ohio exists to reflect the relative susceptibility of each aquifer to contamination.

- 3) Protection of Aquifers Susceptible to Contamination: Aquifers and/or locations that are deemed susceptible to contamination include the following: unconsolidated aquifers capable of yielding 100 gallons/minute for 24 hours (i.e. thick sand & gravel); karst limestone areas; sand and gravel quarries; and limestone or sandstone quarries. Such aquifers or areas are considered susceptible to contamination due to their prolific water yield and/or their typically thin or absent overlying clay or other confining layer. These aquifers represent a resource of plentiful public and private water that while not the only option for those areas where they exist, are usually the only source of high yield and good quality water in those areas.
- 4) Conditions Conducive to Ground Water Contamination: Separation distance between the facility's waste and the first continuous zone of saturation - several studies done by DDAGW have shown that when the separation distance between waste and a saturated zone or aquifer (i.e. amount of clay, sand, rock b/w aquifer and waste) is less than fifteen feet, the occurrence of ground water contamination is high, and occurrence increases with decreased separation distance below fifteen feet. Therefore, higher points were given for less separation distance.
- 5) Engineering Controls: When these engineering controls are present, they provide added protection against leachate releases to ground water beneath the facility. Therefore, extra points were given for C&DD facilities with a partial or no liner, and for a partial or no leachate collection system.
- 6) Ground Water Monitoring: The priority criterion focuses on ground water monitoring and the potential indication of a release of constituents to ground water.
  - A. For facilities with ground water monitoring, has there been an indication of a release to ground water? If 'yes,' points are assigned to a C&DD facility where there has been an indication of a release of non-hazardous constituents to ground water (10), and extra points (10 more, total of 20) are assigned if the indicated release includes hazardous constituents.

The criteria for determining "indication of a release to ground water" are detailed in the revised DDAGW report *Hydrogeologic Evaluation of 99 Construction & Demolition Debris Facilities in Ohio* (2011) and include, but were not restricted to, the following:

- The presence of volatile organic compounds (VOCs) in a downgradient well,
- The presence of an increasing trend in a constituent at a downgradient well,
- Elevated concentrations (e.g. order of magnitude) in a downgradient monitoring well,
- Ammonia concentrations exceeding three milligrams per liter in a downgradient monitoring well but not in an upgradient well.

Additionally, previous reports and studies were reviewed and considered in making the determinations.

- B. Facilities without ground water monitoring do not have the "early warning system" that a monitoring well network provides, and thus increase the potential for more widespread

ground water contamination. Therefore, unmonitored sites are awarded an additional 10 points, whereas monitored sites are not.

Adjustments – raw scores may be adjusted to account for more updated/accurate information or site-specific factors not already captured in the above criteria that may contribute to a potential release and subsequent impact to ground water. Adjustments are intended to be made by Ohio EPA district personnel, in conjunction with the approved health district representative (if applicable), and must also be done in cooperation with Ohio EPA Central Office.

- Adjustments for updated or more accurate information. Examples of updated information: new information on the presence or absence of nearby water supply wells; a new or updated SWAP area; discovery that only a small percentage of the facility is actually lined or has LCS, rather than the approximately 50% assumed by the term "partial" in Criteria 5. In these cases, the adjustments should be commensurate to the range of points allowed in the Criteria above. For example, if a facility known to be partially lined was later discovered to be 80% unlined, the adjustment plus the original points allotted at the screening level in Criteria 5 should be less than the maximum 20 points for "no liner," and should be an approximate percentage (e.g. 80% unlined x 20 points max = 16 points; so the adjustment to the original 10 points would be +6 points = 16).
- Adjustments for information outside of Criteria 1-6. Examples of site-specific factors outside of Criteria 1-6 include, but are not limited to: debris placement in a coal mining area where underground mines function as an aquifer system; debris placement in a "probable karst" area with known ground water users nearby; relatively large debris fill acreage and/or volume, debris emplaced under water, poor management/operational practices. In no case shall the adjustment be greater than 20 points.