Diesel Risk Assessment & 1st Level Screening Worksheets

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Health Risk Assessments

- Health Risk Assessments are conducted for all Hazardous Air Pollutants listed in a permit application
- Negligible risks are considered to be:
  - Carcinogens (Cancer-Causing Chemicals) Total incremental risk less than or equal to 1×10^{-6}, (1E-6, or 1 in a million)
  - Noncarcinogens Total hazard index less then or equal to 1

1st Level Screening Worksheets

- Worksheet can be found at http://www.state.nj.us/dep/aqpp/risk.html
  - Excel spreadsheet
  - Several documents at website related to risk assessments
- Worksheet inputs needed:
  - Stack height (feet)
  - Distance to the nearest property line (feet)
  - Annual emission rates for carcinogenic HAP (tons per year)
  - Hourly emission rate for HAP with short term health effects (pounds per hour)

1st Level Screening Worksheet

- Example #1
  - Stack height – 20 feet
  - Distance to the nearest property line – 100 feet
  - Benzene (carcinogenic) annual emission rate - 0.05 tons per year
  - Incremental cancer risk ($3.7x10^{-6}$ significant)
- Options to lower risk:
  - Install a better control device/upgrade control device
  - Reduce hours
  - Increase stack height
  - Move source further away from property line

1st Level Screening Worksheet

- Example #1A – Double stack height to reduce risk
  - Stack height – 40 feet
  - Distance to the nearest property line – 100 feet
  - Benzene emission rate - 0.05 tons per year
  - Incremental cancer risk (0.89×10^{-6} insignificant)
- 2nd level assessment necessary if 1st level is not determined to be negligible
  - 2nd level takes into account unique stack parameters and facility outlay
  - Department or facility can conduct

1st Level Screening Worksheet

- If 2nd level risk is still greater than 1x 10^{-6}:
  - Facility is contacted to see if HAP emissions can be reduced.
  - Internal Risk Management Committee meeting is held
    - Includes air quality modeling, permitting, and enforcement staffs
    - Evaluate what else can be done to lower risk
    - Consider the facility as a whole and any unique aspects of the facility

Diesel engine risk screening worksheet

- Can be used in lieu of 1st level risk screening worksheet
- Several advantages
  - Automatically calculates diesel particulate emissions.
  - Includes plume rise based on engine capacity
  - Indicates whether engine could be approved if a 2nd level risk assessment is conducted

Diesel engine risk screening worksheet

- Diesel engine risk screening input:
  - Engine Tier (1-4) or year of manufacture
  - Engine's rated horsepower
  - Maximum annual hours of operation
  - Distance to the property line
- Diesel engine risk screening outputs if risk level is:
  - Less than 10 in a million, risk is shown in GREEN and should be approvable
  - Between 10 and 100 in a million, risk is shown in **YELLOW** and may be approvable
  - Greater than 100 in a million, risk is shown in RED and is most likely not approvable

Diesel engine risk screening worksheet

Some examples:

Engine rated capacity (horsepower)	Tier Level or Date of manufacture	Annual hours of operation	Distance to Property Line (ft)	Incremental Cancer Risk
500	2010	500	500	9.2×10^{-6}
300	3	1500	100	5.1×10^{-5}
700	2003	2000	50	1.9×10^{-4}

Diesel engine risk screening worksheet

- Ways to reduce risk from Diesel Particulate Emissions
  - Install air contaminant control device
  - Use ultralow sulfur diesel fuel (15 ppmw)
  - Minimize annual operating hours
  - Move engine away from property line
  - Conduct a 2nd level risk assessment
- Access worksheet, instructions, and background information at