



**Utah Division of Air Quality
New Source Review Section**

**Form 5
Adsorption Unit**

Company _____

Site/Source _____

Date _____

Equipment Information			
1. Name of control device: _____		2. Manufacturer: _____ Model no. _____	
3. Provide diagram of unit: _____		4. Type of air contaminant controlled: _____	
Gas Stream Characteristics			
5. Components: Mole % A. _____ B. _____ C. _____ D. _____		6. Total flow rate (acfm): Design maximum: _____ Average expected: _____	
7. Gas stream temperature (°F): Inlet _____ Outlet _____		8. Pressure drop across unit: (inch H ₂ O Gauge) _____	
Adsorbent Characteristics			
9. Material to be adsorbed (chemical name of adsorbate): _____		10. Type of adsorbent: _____	
11. Number of beds per unit: _____	12. Weight of adsorbent per bed: _____	13. Bed depth (ft): _____	14. Bed volume (ft ³): _____
15. Saturation Capacity of Pollutant on adsorbent (supply units): _____		16. Length of mass transfer zone (inches): _____	
Regenerative Systems			
17. Type of regeneration: <input type="checkbox"/> Replacement <input type="checkbox"/> Steam <input type="checkbox"/> Other specify _____			
18. Method of regeneration: <input type="checkbox"/> Alternate use of _____ entire units <input type="checkbox"/> Alternate use of _____ beds in a single unit <input type="checkbox"/> Source shut down <input type="checkbox"/> Other: Describe _____			
Average Operation of Source		Maximum Operation of Source	
19. Time on line before regeneration: Min/bed		21. Time on line before regeneration: Min/bed	
20. Efficiency of adsorber: %		22. Efficiency of adsorber: %	

Form 5 Adsorption Unit - Continued

Emissions Calculations (PTE)

23. Calculated emissions for this device

PM₁₀ _____ Lbs/hr _____ Tons/yr

PM_{2.5} _____ Lbs/hr _____ Tons/yr

NO_x _____ Lbs/hr _____ Tons/yr

SO_x _____ Lbs/hr _____ Tons/yr

CO _____ Lbs/hr _____ Tons/yr

VOC _____ Lbs/hr _____ Tons/yr

CO₂ _____ Tons/yr

CH₄ _____ Tons/yr

N₂O _____ Tons/yr

HAPs _____ Lb s/hr (speciate) _____ Tons/yr (speciate)

Submit calculations as an appendix. If other pollutants are emitted, include the emissions in the appendix.

Instructions

NOTE: 1. **Submit this form in conjunction with Form 1 and Form 2.**

2. Call the Division of Air Quality (DAQ) at **(801) 536-4000** if you have problems or questions in filling out this form. Ask to speak with a New Source Review engineer. We will be glad to help!

1. Supply the name of the control equipment.
2. Indicate the manufacturer and the model number of the equipment.
3. Supply an assembly drawing showing all the duct work and its connection to the vapor absorber and any pre-cleaners. Show duct work from adsorber units and auxiliary equipment, including final vent. Show all of the following details which apply:
 - a. Sizes and shapes of all hoods.
 - b. Diameters or cross-sectional dimensions and lengths of all branch and main ducts.
 - c. Locations, sizes and shapes of all bends, junctions and transition pieces.
 - d. Locations, sizes and shapes of all passageways other than ordinary ducts. Also show all cooling devices (spray chambers, heat exchangers, cool columns, etc.)
 - e. Locations and descriptions of all dampers, baffles and similar controls.
 - f. Locations, sizes and shapes of any by-passes around the control equipment. Describe how operated, stating under what conditions and for what lengths of time these by-passes are used.
4. List the type of contaminant that the system is used to control.
5. Supply the components of the gas stream including mole percent.
6. Indicate the gas stream flow rates at design maximum and average.
7. Indicate what the gas stream temperature is when it enters and exits the unit.
8. What is the design pressure drop across the unit?
9. What chemical will be adsorbed?
10. Indicate the material which will be adsorbing the chemical.
11. Indicate the number of beds of adsorbent in each unit.
12. Indicate the weight of the adsorbent in each unit.
13. How deep is each bed of adsorbent?
14. How many cubic feet of adsorbent is in each bed?
15. Indicate the saturation capacity of pollutant on the adsorbent.
16. How long is the mass transfer zone?
17. Indicate how the regeneration of the adsorbent is done.
18. Indicate the method of regeneration.
19. Supply the time on line before regeneration occurs during the average operation of the source.
20. Supply the efficiency of the adsorber during average operation of the source.
21. Supply the time on line before regeneration occurs during maximum operation of the source.
22. Supply the efficiency of the adsorber during maximum operation of the source.
23. Supply calculations for all criteria pollutants and HAPs. Use AP42 or Manufacturers data to complete your calculations.