

US EPA ARCHIVE DOCUMENT

Appendix D

List of EBPIs Measured and Detailed Statistical Analysis

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Environmental Business Practice Indicators

Environmental Business Practice Indicators (EBPIs) are the high-priority compliance issues and best management practices for printers. The 32 printer EBPIs were developed, early in the project, through discussions among WDNR staff as well as stakeholders. They were used to measure and compare printer performance on key environmental issues and include 7 BMPs, 22 compliance practices, and 3 questions to characterize the printers in the samples.

The EBPIs are listed here in the order they were originally determined (prior to establishing the inspection questions). For this reason, they may not correspond directly to the inspection numbering.

Air Pollution

1. Where does the facility fall, with respect to the VOC size category?
2. Are all press material containers closed except when filling/dispensing?
3. Are soiled shop towels stored in closed containers when not in use?
4. Is less than 1.5 gallons per day added to cold cleaning unit? (average over number of days since last addition)
5. Are all fountain solution mixing and storage tanks covered except when adding or draining solution?
6. Does the blanket or roller wash meet one of the following limits: a. $\leq 30\%$ VOC by weight or b. ≤ 10 mmHg vapor pressure at 68°F ?
7. Does the fountain solution meet the limit of $\leq 13.5\%$ VOC by weight?
8. For any non-heatset presses, does fountain solution meet limit of $\leq 5\%$ VOC by weight and contain no restricted alcohol?
9. For any sheet-fed presses, does fountain solution meet limit of $\leq 5\%$ VOC by weight, or $\leq 8.5\%$ VOC by weight if refrigerated to $\leq 60^{\circ}\text{F}$?
10. For a heatset press, does fountain solution meet **one** of these limits: a. if contains no restricted alcohol, $\leq 5\%$ VOC by weight; b. if contains restricted alcohol and refrigerated to $\leq 60^{\circ}\text{F}$, $\leq 3.0\%$ VOC by weight; or c. if contains any restricted alcohol and not refrigerated to $\leq 60^{\circ}\text{F}$, $\leq 1.6\%$ VOC by weight?
11. Is the heatset press dryer pressure lower than the press room pressure?
12. Can the facility show that they are in compliance with state HAP requirements?
13. Is the shop using any recommended BMPs (re-use clean up solvents; recycle/re-use inks; use water based or alternative inks)?

Hazardous Waste

14. Does the facility generate hazardous waste?
15. Does the facility use on-site solvent recycling system?
16. Does the facility use recycled solvent in any process?

Spills Response and Reporting

17. Have they had a spill in the last 12 months?
18. Was the spill above the federal reportable quantities for either hazardous substances (CERCLA) or extremely hazardous substances (EPCRA)?
19. In the event of a spill, do they understand what their spill clean-up responsibilities are? (Answer yes if they have at least a general understanding like "stop the spill if it's safe to do so, and call local emergency responders.")
20. Do they have an emergency response plan for HAZWOPER requirements?
21. Do they provide secondary containment for all oil and chemical containers?

Stormwater

22. Have they submitted a No Exposure Certification form to DNR?
23. Do they have a stormwater discharge permit?
24. Can they make changes to qualify for a No Exposure Certification?

Wastewater

25. Is the facility on a septic system?
26. Do they meet all the local POTW's requirements?

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27. Do they have a permit to discharge to surface or ground water?
28. Do they use a Silver Recovery Unit?
29. Is the silver-bearing wastewater shipped off-site for recycling using a precious metal transporter?
30. Do they neutralize the CTP waste prior to disposal?
31. Are there warning signs posted at every sink regarding disposal of wastes and hazardous materials?
32. Do they run a "dry shop"? A dry shop meets all of the following criteria: a. little or no water is used to clean floors and equipment, b. wet mops are used to clean up spills, and c. absorbents are used for larger spills.

Detailed Statistical Analysis

This appendix presents the detailed analysis of the EBPIs developed for the printer ERP project. The observed percentage represents the performance rate observed during baseline evaluations and post-certification inspections at the randomly selected facilities. Confidence interval is the range that is believed to contain the actual population proportion for the entire population, not just the facilities surveyed. We used a confidence level of 95% for all statistical comparisons. Estimated population percentage is an estimate of how the entire universe is performing. The confidence intervals and difference in proportion were calculated using the EPA's 2006 Results Analyzer tool.

Note that some questions do not always reflect the correct number of responses based on previous questions that are related. The project lead could not always identify if the inspectors entered data that might be incorrect. Therefore, we did not adjust and data, and instead analyzed the responses as entered in the inspection reports.

Symbols used in the following tables: ↑ = increased; ↔ = unchanged; ↓ = decreased. Changes which were statistically significant at the 95% confidence level are highlighted. For marginally non-significant results, we performed analyses at the 90% confidence level also and have indicated where tests would be significant at that level.

Air Quality

(1.201) Are all press material containers closed except when filling/dispensing?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	42	12	77.8	65.2-86.7	76.0
Post-certification	69	9	88.5	79.6-93.7	86.6
Difference in Proportion	10.70% ± 13.10%			-2.40 to 23.80	↑

(1.202) Are soiled shop towels stored in closed containers when not in use?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	35	19	64.8	51.6-76.1	63.8
Post-certification	53	23	69.7	58.8-78.7	68.7
Difference in Proportion	4.90% ± 16.30%			-11.40 to 21.20	↑

(1.205) Are all fountain solution mixing and storage tanks covered except when adding or draining solution?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	30	3	90.9	76.5-96.8	86.7
Post-certification	49	7	87.5	76.5-93.7	85.1
Difference in Proportion	-3.40% ± 13.10%			-16.50 to 9.70	↓

(3.101) Where does the facility fall, with respect to the VOC size category?					
Survey	Very Small	Small / Med	Observed %	Confidence Interval %	Estimated Population %
Baseline	48	6	88.9	77.9-94.7	86.3
Post-certification	71	8	89.8	81.4-94.7	88.1
Difference in Proportion	1.0% ± 10.6%			-9.70 to 11.6	↑

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(3.201) Is less than 1.5 gallons per day added to cold cleaning unit?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	13	0	100	77.2-100	88.6
Post-certification	19	2	90.5	71.1-97.3	84.2
Difference in Proportion			-9.50% ± 12.80%	-22.30 to 3.30	↓

(3.301) Does the blanket or roller wash meet one of the following limits: a. ≤30% VOC by weight or b. ≤10 mmHg vapor pressure at 68°F?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	8	9	47.0	26.2-69.0	47.6
Post-certification	20	2	90.9	72.2-97.4	84.8
Difference in Proportion			43.9% ± 27.3%	16.6 to 71.1	↑ Significant

(3.304) Does the fountain solution meet the limit of ≤13.5% VOC by weight?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	10	1	90.9	62.3-98.4	80.3
Post-certification	8	1	88.9	56.5-98.0	77.2
Difference in Proportion			-2.0% ± 28.1%	-30.1 to 26.1	↓

(3.305) For any non-heatset presses, does fountain solution meet limit of ≤5% VOC by weight and contain no restricted alcohol?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	11	3	78.6	52.4-92.4	72.4
Post-certification	13	3	81.3	57.0-93.4	75.2
Difference in Proportion			2.7% ± 29.7%	-27.0 to 32.4	↑

(3.306) For any sheet-fed presses, does fountain solution meet limit of ≤5% VOC by weight, or ≤8.5% VOC by weight if refrigerated to ≤60°F?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	13	0	100	77.2-100	88.6
Post-certification	10	1	90.9	62.3-98.4	80.3
Difference in Proportion			-9.1% ± 17.8%	-26.9 to 8.7	↓

(3.307) For a heatset press, does fountain solution meet one of these limits: a. if contains no restricted alcohol, ≤5% VOC by weight, b. if contains restricted alcohol and refrigerated to ≤60°F, ≤3.0% VOC by weight, or c. if contains any restricted alcohol and not refrigerated to ≤60°F, ≤1.6% VOC by weight?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	6	1	85.7	48.7-97.4	73.1
Post-certification	3	0	100	43.9-100	72.0
Difference in Proportion			14.3% ± 28.0%	-13.7 to 42.3	↑

(3.308) Is the heatset press dryer pressure lower than the press room pressure?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	7	0	100	64.6-100.0	82.3
Post-certification	4	0	100	51.0-100.0	75.5
Difference in Proportion			0	0	↔

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(3.701) Can the facility show that they are in compliance with state HAP requirement?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	31	15	67.4	53.1-79.0	66.1
Post-certification	65	3	95.6	87.9-98.4	93.2
Difference in Proportion	28.2% ± 14.4%			13.8 to 42.6	↑ Significant

(1.219) Do they re-use clean up solvents? (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	4	50	7.41	3.0-17.5	10.3
Post-certification	11	67	14.1	8.2-23.4	15.8
Difference in Proportion	6.7% ± 10.3%			-3.6 to 17.0	↑

(1.220) Do they recycle/re-use inks? (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	20	34	37.04	25.5-50.3	37.9
Post-certification	35	43	44.87	34.5-55.8	45.1
Difference in Proportion	7.8% ± 16.9%			-9.0 to 24.7	↑

(1.221) Do they use water-based or other alternative inks? (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	34	20	62.9	49.7-74.5	62.1
Post-certification	42	35	54.5	43.7-65.0	54.4
Difference in Proportion	-8.4% ± 14.2%			-22.6 to 5.8	↓

Hazardous Waste

(4.101) Does the facility generate and/or store hazardous waste?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	39	13	75.0	61.9-84.7	73.3
Post-certification	68	11	86.1	76.9-91.9	84.4
Difference in Proportion	11.1% ± 14.0%			-2.9 to 25.1	↑

(4.125) Does the facility use on-site solvent recycling system? (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	2	51	3.8	1.1-12.7	6.9
Post-certification	4	71	5.3	2.2-12.8	7.5
Difference in Proportion	1.6% ± 7.2%			-5.6 to 8.7	↑

(4.126) Does the facility use recycled solvent in any process? (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	3	50	5.6	2.0-15.3	8.7
Post-certification	12	62	16.2	9.7-26.1	17.9
Difference in Proportion	10.6% ± 10.4%			0.2 to 20.9	↑ Significant

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Spills Prevention and Response

(1.401) Do they provide secondary containment for all oil and chemical containers?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	8	44	15.4	8.1-27.4	17.8
Post-certification	21	52	28.8	19.8-39.8	29.8
Difference in Proportion	13.4% ± 14.2%			-0.8 to 27.6	↑ * Significant at 90% confidence level

(6.101) Have they had a spill in the last 12 months? [Analyzed for “No” as desired response.]					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	2	52	96.3	87.5-98.9	93.5
Post-certification	4	74	94.9	87.6-97.9	92.7
Difference in Proportion	-1.4% ± 7.0%			- 8.4 to 5.6	↓

(6.102) Was the spill exempt from all reporting by meeting any one of the following thresholds: <ul style="list-style-type: none"> • a petroleum product spilled on an impervious surface; • less than 1 gal gasoline; • less than 5 gallons other petroleum products; or • less than the reportable quantity for a federal substance? 					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	1	0	100.0	20.7-100	60.4
Post-certification	6	0	100.0	61.0-100	80.5
Difference in Proportion	0 ± 0			0	↔

(6.106) In the event of a spill, do they understand what their spill clean-up responsibilities are?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	50	2	96.1	87.1-98.9	93.0
Post-certification	70	3	95.9	88.7-98.5	93.6
Difference in Proportion	-0.3% ± 6.9%			-7.2 to 6.6	↓

(6.204) Do they have an emergency response plan for HAZWOPER requirements?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	8	36	18.2	9.6-31.9	20.8
Post-certification	8	30	21.0	11.2-36.2	23.7
Difference in Proportion	2.9% ± 17.3%			-14.5 to 20.2	↑

Storm Water

(1.502) If they have exposed materials, could the printer make changes to qualify for a No Exposure Certification?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	12	3	80.0	54.8-92.9	73.8
Post-certification	12	8	60.0	38.7-78.0	58.4
Difference in Proportion	-20.0% ± 30.3%			-50.3 to 10.3	↓

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(7.101) Have they submitted a No Exposure Certification form to DNR?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	4	48	7.7	3.1-18.1	10.6
Post-certification	7	63	10.0	5.0-19.1	12.0
Difference in Proportion	2.3% ± 10.0%			-7.7 to 12.4	↑

(7.102) Do they have a storm water discharge permit?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	5	44	10.2	4.5-21.7	13.1
Post-certification	5	54	8.5	3.8-18.3	11.1
Difference in Proportion	-1.7% ± 11.0%			-12.8 to 9.3	↓

Wastewater

(1.503) Is the facility on a septic system? [Analyzed for "No" as desired response.]					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	4	50	92.6	82.5-97.0	89.8
Post-certification	7	65	90.3	81.4-95.1	88.3
Difference in Proportion	-2.3% ± 9.7%			-12.0 to 7.4	↓

(7.203) Do they meet all the local POTW's requirements?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	19	5	79.2	59.6-90.7	75.2
Post-certification	46	6	88.5	77.1-94.5	85.8
Difference in Proportion	9.3% ± 18.7%			-9.4 to 28.0	↑

(7.204) Do they have a permit to discharge to surface or ground water?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	0	16	0.0	0.0-19.4	9.7
Post-certification	2	45	4.26	1.2-14.2	7.7
Difference in Proportion	4.3% ± 5.8%			-1.5 to 10.0	↑

(7.211) Do they use a Silver Recovery Unit?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	10	5	66.67	41.8-84.8	63.3
Post-certification	14	23	37.84	24.2-53.8	39.0
Difference in Proportion	-28.8% ± 29.2%			-58.0 to 0.4	↓ * Significant at 90% confidence level

(7.212) Is the silver-bearing wastewater shipped off-site for recycling using a precious metal transporter?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	9	5	64.3	38.8-83.6	61.2
Post-certification	11	14	44.0	26.8-62.8	44.8
Difference in Proportion	-20.3% ± 32.6%			-52.9 to 12.3	↓

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(7.216) Do they neutralize the Computer-to-Plate waste prior to disposal?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	6	9	40.0	19.9-64.2	42.1
Post-certification	11	24	31.4	18.7-47.9	33.3
Difference in Proportion			-8.6% ± 29.9%	-38.5 to 21.3	↓

(1.517) Are there warning signs posted at every sink regarding disposal of wastes and hazardous materials? (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	1	47	2.1	0.4-10.9	5.6
Post-certification	11	59	15.7	9.1-25.9	17.5
Difference in Proportion			13.6% ± 9.4%	4.3 to 23.0	↑ Significant

(1.518) Do they run a 'dry shop'? A dry shop meets all of the following criteria: a. little or no water is used to clean floors and equipment, b. wet mops are used to clean up spills, and c. absorbents are used for larger spills. (BMP)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	44	10	81.5	69.2-89.5	79.3
Post-certification	65	13	83.3	73.7-89.9	81.8
Difference in Proportion			1.9% ± 13.2%	-11.3 to 15.0	↑

Other Measures of Compliance and Best Management Practices

These next tables show the statistical analyses of requirements and practices which were highlighted as goals in the original project plan, but which had not been proposed by the stakeholder group that developed the EBPIs. We called these the Compliance Measures and Best Management Practices in the report.

(1.301) Do they follow all the shop towels management requirements, so they can be reused? a. store wipes and rags without excess liquid in them, b. store in a covered container, c. store away from sources of ignition, d. label containers 'dirty solvent rags only', e. do not place different materials in same container, f. do not put other waste into rag or wipes containers.					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	27	19	58.7	44.4-71.6	58.0
Post-certification	49	25	66.2	55.1-75.8	65.5
Difference in Proportion			7.5% ± 17.80%	-10.30 to 25.30	↑

(1.302) Are all drums in final (90 or 180 day storage) accumulation area labeled with all of the following items: (A) 'hazardous waste', (B) the name of the waste, and (C) the date?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	9	9	50.0	29.1-70.9	50.0
Post-certification	17	16	51.5	35.3-67.4	51.3
Difference in Proportion			1.5% ± 24.6%	-23.0 to 26.1	↑

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(1.303) Are all drums tightly closed unless adding or removing wastes?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	13	3	81.2	57.0-93.4	75.2
Post-certification	33	6	84.6	70.4-92.7	81.6
Difference in Proportion	3.4% ± 22.7%			-19.4 to 26.1	↑

(1.304) SQG and LQG: Do all accumulation drums (in 90 or 180 day storage) have date of first accumulation or date when filled if moved from satellite accumulation? (One or both may apply.)					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	6	0	100	61.0-100	80.5
Post-certification	6	2	75.0	41.0-92.8	66.9
Difference in Proportion	-25.0% ± 32.2%			-57.0 to 7.0	↓

(1.306) Has SQG shipped all waste within 180 days of being dated?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	5	0	100	56.6-100	78.2
Post-certification	6	0	100	61.0-100	80.5
Difference in Proportion	0 ± 0				↔

(1.307) Has LQG shipped all waste within 90 days of being dated?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	2	0	100	34.2-100	67.1
Post-certification	2	0	100	34.2-100	67.1
Difference in Proportion	0 ± 0				↔

(1.308) SQG and LQG: Are there more than 55 gallons of each type of waste in a satellite accumulation area? [Analyzed for "No" as desired response.]					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	1	5	83.3	43.7-97.0	70.4
Post-certification	0	8	100	67.6-100	83.8
Difference in Proportion	16.7% ± 32.6%			-16.0 to 49.3	↑

(1.309) SQG and LQG: Have all filled waste containers of less than 55 gallons been: (A) dated by marking on the container, and (B) moved from the satellite accumulation area to the storage accumulation area within 3 days of date they were filled?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	6	0	100	61.0-100	80.5
Post-certification	5	1	83.3	43.7-97.0	70.4
Difference in Proportion	-16.7% ± 32.6%			-49.3 to 16.0	↓

(1.310) SQG and LQG: If not in a satellite accumulation area, have all containers been dated on the day waste was first placed in the container?					
Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	5	0	100	56.6-100	78.2
Post-certification	6	2	75.0	41.0-92.8	66.9
Difference in Proportion	-25.0% ± 32.0%			-57.0 to 7.0	↓

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(4.105) Do they follow all of the universal waste management requirements listed?
 (A) inventory all universal wastes generate,
 (B) ensure all listed are recycled,
 (C) prevent all leaks, spills, or other releases,
 (D) label containers as Universal Waste and identify specific contents,
 (E) document time of accumulation on site by dating when waste first placed inside,
 (F) accumulate universal wastes no more than 1 year,
 (G) train employees on management and emergency procedures related to the wastes,
 (H) respond to spills promptly.

Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	23	15	60.5	44.8-74.3	59.6
Post-certification	43	21	67.2	55.2-77.3	66.3
Difference in Proportion	6.7% ± 19.4%			-12.7 to 26.0	↑

(4.106) Are their soiled shop towels considered hazardous waste because of excess liquid in containers, or because they meet the definition of a characteristic or listed waste? If either one applies, the answer is yes.

Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	16	25	39.0	25.8-54.1	40.0
Post-certification	33	29	53.2	41.2-64.9	53.1
Difference in Proportion	14.2% ± 19.4%			-5.2 to 33.6	↑

(4.122) Is universal waste shipped to licensed disposal facilities following all proper shipping requirements listed?
 (A) comply with all DOT regulations including packaging, labeling, marking and placarding;
 (B) respond to releases and manage residues promptly;
 (C) ensure equipment used to load/unload waste will not damage containers;
 (D) ensure containers are secured against movement within transport vehicle.

Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	28	11	71.8	56.3-83.3	69.8
Post-certification	40	12	76.9	64.0-86.1	75.1
Difference in Proportion	5.1% ± 18.2			-13.1 to 23.4	↑

(4.123) Are shop towels sent out to a commercial laundry?

Survey	Yes	No	Observed %	Confidence Interval %	Estimated Population %
Baseline	34	17	66.7	53.1-77.9	65.5
Post-certification	55	21	72.4	61.6-81.0	71.3
Difference in Proportion	5.7% ± 16.3%			-10.6 to 22.0	↑