

Summary Report

2003 TOOLS FOR SCHOOLS EVALUATION SURVEY RESULTS

Presented by

The Connecticut School Indoor
Environment Resource Team



October 2004

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BACKGROUND

There has been a growing concern regarding health problems linked to poor indoor air quality (IAQ) in buildings, including school facilities. Students and staff are exposed to poor IAQ from a wide range of causes in schools, including inadequate ventilation, moisture intrusion, and poor maintenance and operation of HVAC systems. Moisture intrusion can result in the growth of mold and other microorganisms. Other exposures include air pollutants related to laboratories, machine and wood working shops, kitchens, and copy and printing shops. The most important direct cause of poor indoor air quality is inadequate fresh air ventilation, regardless of what other factors may contribute to this condition.

The two terms people use to describe health effects experienced indoors are *Sick Building Syndrome* and *Building Related Illness*. Sick Building Syndrome tends to cause a range of symptoms such as eye, nose and throat irritation, headaches and feelings of lethargy. With Building Related Illness, there is a clear-cut relationship between symptoms and exposure to one or more infective, toxic or immunological agents in an indoor environment. Agents in the indoor environment can cause and/or exacerbate serious immunological diseases such as asthma and hypersensitivity pneumonitis. Children and teachers with these ailments may experience chronic, even life threatening disease, if problems creating them are not recognized and corrected at an early stage (1). Addressing school indoor air quality issues is an important part of the overall strategy to reduce the impact of asthma in Connecticut. Reducing asthma triggers in schools is part of Connecticut's coordinated asthma management program.

The extent of IAQ problems in Connecticut schools was well documented in a September 2000 study commissioned by the Connecticut state legislature (Indoor Air Quality in Connecticut Schools, Connecticut Academy of Science and Engineering, 7/25/2000). Among the findings of the study was that 68 percent of Connecticut schools reported indoor environmental problems. This finding is important, as there is a large population of children and adults potentially exposed to IAQ hazards. In 2001, there were 555,689 students enrolled in local public schools, 10,910 students in regional vocational technical schools, and 69,956 students in non-public schools in Connecticut. In addition, during this period, there were over 85,700 employees working in public schools in Connecticut.

Like many states, Connecticut has a variety of agencies and organizations that have some responsibility for school IAQ. Because there are no IAQ standards, local, state and federal agencies are limited in their response to school IAQ complaints. In addition, virtually all school districts have funding issues that have limited their response. The U.S. Environmental Protection Agency (EPA) has developed an effective program to assist schools in identifying and addressing IAQ problems. The EPA Tools For Schools is based on an action kit that provides materials necessary to promote a low-cost, preventive, problem-solving team approach to improving IAQ. A committee or "building team" made up of administrators, teachers, maintenance staff, school nurses and parents utilizes the kit to investigate and prioritize indoor air hazards. Short and long-term strategies are then developed to assist the schools in solving IAQ problems.

In the late 1990s, several Connecticut agencies, along with staff from EPA New England regional office, had made efforts to promote the TfS program in Connecticut, with limited success. With a fragmented system of responsibility for IAQ in schools, there was a strong need to develop a comprehensive and coordinated statewide strategy to promote EPA's Tools for Schools (TfS) kit and program as a viable, pro-active intervention to address IAQ problems in Connecticut schools. In January 1999, staff from the Connecticut Department of Public Health (CT DPH), the Connecticut Council for Occupational Safety and Health (CTCOSH) - an advocacy organization, and EPA Region I developed the idea of pooling resources and developing a coordinated response. The team or consortium - the Connecticut School Indoor Environment Resource Team (CSIERT) - has grown to include 22 agencies and organizations (see Attachment A). The overall goal of CSIERT is to improve indoor air quality in Connecticut schools, principally by implementing the TfS program in every Connecticut public school building. CSIERT's main objectives are: 1) to develop and execute a more systematic outreach program to promote TfS, and 2) to provide training and other technical assistance to schools to implement the TfS program. A two session training program for TfS building teams covering IAQ health issues, how TfS works,

communication, conducting site walkthroughs, and prioritizing IAQ problems was developed. Since 2000, CSIERT has trained over 1800 school staff and parents in almost 360 schools in 60 school districts in Connecticut.

The Connecticut General Assembly sought to address school IAQ problems in 2003 by enacting Public Act No. 03-220, An Act Concerning Indoor Air Quality In Schools. The bill includes several provisions, including a requirement that all schools adopt an IAQ program. The CT DPH and CSIERT support the TfS program as a primary way for schools to meet this requirement of the Act. Since this Act was enacted, there has been a steady increase in school districts electing to implement the TfS program.

In 2002, a University of Connecticut Masters in Public Health student conducted an initial evaluation project to attempt to document impacts and outcomes derived from implementing TfS in a number of Connecticut schools (See Attachment B). This survey project found that survey participants (25 schools, 50% response rate) reported identifying and repairing such problems as ventilation (49%), water incursion (41%) and source reduction (31%). Forty-one percent of the respondents noted a decrease in IAQ-related symptoms. In 2003, a new evaluation project was undertaken to survey a larger sample of schools and attempt to collect health outcome data. This report summarizes the 2003 evaluation project.

METHODOLOGY

As mentioned above, an impact/outcome evaluation of Connecticut schools was conducted in 2002. A survey instrument was developed and distributed to a sample of TfS building team coordinators. This survey instrument was revised for the 2003 evaluation effort. The main revision was the addition of a list of questions for the school nurse to answer. The principal objectives of the survey were to collect information about:

- Documentation of IAQ problems,
- Utilization of TfS to make changes,
- Identification of barriers the teams may have encountered
- Whether implementation of TfS has had an impact on health in schools.

The survey instrument (Attachment C), along with a cover letter, was mailed to TfS building team coordinators at all 177 schools that had implemented the program at the time of the mailing. These schools were chosen on the basis of having completed the 2-session training mentioned above and having at least 6 months additional time to implement the program. The coordinators were asked to answer all questions except those pertaining to health. The school nurse was asked to answer the health questions on page 3 of the survey. Follow-up phone calls were made to increase participation from schools that did not initially respond. A total of 77 schools (44%) responded. The survey responses were entered into a Microsoft Access database for analysis.

SURVEY RESULTS

Demographics of Respondents:

The following presents information on the TfS building team coordinators, and the types of schools they represented.

Occupation/Role of TfS Building Team Coordinator:

- School Nurse: 48.0% (36)
- Facility Mgr: 2.7% (2)
- Administrator: 30.7% (23)
- Teacher: 17.3% (13)
- Parent: 1.3% (1)

Breakdown of Schools Responding:

- High School: 14.3% (11)
- Middle School: 14.3% (11)
- Elementary: 71.4% (55)

Implementing Tools For Schools (Questions 1, 2, 3, 4, 10, 11, 12):

These questions are listed below. These survey questions sought to collect information on the implementation process, and whether the school had any type of IAQ program before implementing TfS. Of interest were the responses for motivating factors for TfS implementation (# 3). The high number of schools reporting that the motivating factor was a district wide mandate relates to the CSIERT protocol requiring all schools in a district to implement the program. Of the responses on # 4, the most important are “Prioritize Repairs & Upgrades,” and “ Develop & Distribute Summary Report.” These steps are crucial components of the implementation process. The majority of schools had completed these steps.

Question # 10 relates to developing a long-term system for support of the TfS program. With the 2003 Connecticut School IAQ Act (Public Act No. 03-220) that mandates that an IAQ program be maintained in every school, the need for a coordinated system becomes more important. Over 87% of schools surveyed reported that their district has a TfS coordinating committee.

An important component of the TfS program and its building teams is parental involvement. Each team should have at least one parent. The primary reason for parents to be involved is to assist in communication efforts. Question # 12 sought to determine the reasons why parents were not involved. As can be seen, an administrative decision was the most frequent reason given for lack of parents on the teams. Although overall there was a relatively low number of schools reporting no parental involvement (19 according to # 11), there is a need for CSIERT to make sure school districts make parental involvement a priority when developing the building teams.

1. Did your school complete **both** of the *IAQ Tools for Schools* trainings (Introductory 3 hours & Walkthrough with Industrial Hygienist)?

YES: 89.5% (68) NO: 10.5% (8)

2. Did your school have an **IAQ management plan** or **health and safety team** that addressed IAQ **prior** to *IAQ Tools for Schools* trainings?

YES: 26.3% (20) NO: 73.7% (56)

3. What were the **motivating factors** to implementing *IAQ Tools for Schools* at your school?

TABLE 1

| Motivating Factor Categories | Frequency |
|---|------------------|
| 1. General health concerns to improve IAQ | 20 |
| 2. Rise in asthma cases | 6 |
| 3. Response to complaints | 5 |
| 4. District wide mandate | 23 |
| 5. Interested in preventing problems | 7 |
| 6. Older building | 4 |
| 7. Mold | 2 |
| 8. Other specific complaints | 5 |

4. Which **IAQ Coordinator Checklist steps** have been **completed** to date? (*Please check*)

- All Steps Completed: 33.8% (26)
- Assess Asbestos Status: 62.3% (48)
- Assess Lead Status: 45.5% (35)
- Assess Pest/Pesticide Status: 70.1% (54)
- Assess Radon Status: 49.4% (38)
- Checklist Log: 96.1% (74)
- Checklists Collected & Summarized: 94.8% (73)
- Develop & Distribute Summary Report: 61.0% (47)

- Distribution of Action Packets: 100% (77)
- Establish or Update School IAQ Policy: 44.2% (34)
- Prioritize Repairs & Upgrades: 72.7% (56)
- Review School Blueprint: 80.5% (62)

10. CSIERT recommends that each school system set up a system or committee to coordinate Tools for Schools efforts for their district. Does such an entity exist in your school system?

YES: 87.5% (76) NO: 12.5% (8)

11. Please check ANY of the following that **participated** in your *IAQ Tools for Schools* process:

- Central School Administration: 46.8% (36)
- Custodial staff: 92.2% (71)
- Facility managers: 63.6% (49)
- Parent Organization (PTO): 28.6% (22)
- Parents: 75.3% (58)
- School Board of Education: 13.0% (10)
- School Health Advisory Board: 7.8% (6)
- School nurses: 98.7% (76)
- School Principal/Admin: 98.7% (76)
- Students: 5.2% (4)
- Teachers: 84.4% (65)

12. EPA and CSIERT believe it is important to have **parents** involved in the *IAQ Tools for Schools* process. If parents were not involved at your school, please list the reasons you believe they were not involved.

- Administrative/Superintendent decision: 40.0% (6)
- No interest/not available: 26.7% (4)
- Plan to involve parents in the future: 6.7% (1)

Implementation Outcomes (Questions 5, 6, 7, 8, 9):

The following questions sought to determine the most important inquiry of the survey: *were schools that implemented TfS able to utilize the program to identify IAQ problems and rectify them?* The questions were divided into problem areas: ventilation, source reduction, water identification and other problems. Source reduction problems relate to identifying and addressing contaminants at their source and eliminating or reducing them. Of these, the most important may be the need to improve maintenance to reduce dirt, dust and other such common contaminants. Another important source problem that schools often encounter is incursion of bus fumes into school buildings due to idling buses. In Connecticut, there have been two interventions to address this problem – an anti-idling law, and a Memorandum of Agreement between the association representing school bus companies and the CT Department of Environmental Protection that greatly limits bus idling. Table 2 presents the findings of question #5.

Schools participating in the survey utilized the TfS program to identify a number of IAQ problems. The main problems identified were as follows:

- Ventilation Problems (combined): 81% (57)
- General Cleaning Improvements: 69% (46)
- Carpet Cleaning/Removal: 70% (47)
- Water Identification Problems (combined): 93% (63)

The two most important IAQ problems generally encountered in schools are ventilation problems and poor maintenance (most often due to reduced maintenance budgets). The reason is that these problems generally affect the most number of

school occupants. In Table # 2, the first line below **ventilation problems*** shows the number and percentage of respondents reporting any type of ventilation problem. This is followed by the specific ventilation problems reported. (Note: Each respondent may have reported one or more ventilation problems). The category **general cleaning improvement needed †** is further down in the table. As is reported, a large majority of schools report identifying these problems (ventilation - 81%; general cleanliness – 69%) and a high percentage of those schools have made progress rectifying these problems (ventilation, 75%; general cleanliness, 54%).

Table 3 reports on the total number of schools, student population and staff that reported they have repaired or scheduled for repair ventilation problems or general cleanliness improvements. The numbers of students and staff represent populations with potential and/or reduced exposures due to interventions made to address these problems. Other important IAQ problems identified and addressed include water identification (moisture control) and carpet cleaning or removal.

The survey inquired about sources of funds for required IAQ-related repairs and upgrades. According to the responses, most schools responding to this question (66%) were able to secure resources from their maintenance or general education budget. Question # 7 asked about new policies that may have been implemented as a result of the TfS program. The two most frequently mentioned were the establishment of IAQ/Health and Safety committees and development of bus idling policies.

TfS is an ongoing program that is continued on a yearly basis. The findings of Question # 8 suggest that there is a need to ensure that school districts sustain their programs.

5. Which IAQ problems have been identified, repaired, or scheduled for repair? (Please check all that apply)

TABLE 2

| IAQ PROBLEM | NO PROBLEM IDENTIFIED | PROBLEM IDENTIFIED | SCHEDULED FOR REPAIR or REPAIRED |
|---|-----------------------|--------------------|----------------------------------|
| | | | (Percent of identified) |
| Ventilation Problems* | 18.6% (13) | 81.4% (57) | 75.4% (43) |
| Obstructions from air vents | 47.8% (32) | 52.2% (35) | 80.0% (28) |
| Filters need upgrading or replacing | 44.6% (29) | 55.4% (36) | 80.6% (29) |
| HVAC units & ventilators need cleaning | 55.4% (36) | 44.6% (29) | 75.9% (22) |
| Temperature/dryness/humidity need improving | 34.8% (24) | 65.2% (45) | 53.3% (24) |
| Arts/sciences room needs ventilating | 75.0% (48) | 25.0% (16) | 68.8% (11) |
| Outdoor air intakes need improving | 62.5% (40) | 37.5% (24) | 54.2% (13) |
| Source Reduction Problems | | | |
| Radon remediation needed | 94.6% (53) | 5.4% (3) | 33.3% (1) |
| Asbestos remediation needed | 79.3% (46) | 20.7% (12) | 75.0% (9) |
| Cleaning products need replacing with “greener products” | 77.8% (49) | 22.2% (14) | 50.0% (7) |
| General Cleaning Improvement Needed † | 31.3% (21) | 68.7% (46) | 54.3% (25) |
| Carpet cleaning or removal needed | 29.9% (20) | 70.1% (47) | 66.0% (31) |
| Pests or pesticide use remediation needed | 69.8% (44) | 30.2% (19) | 84.2% (16) |
| Arts/science materials need replacing with “greener products” | 82.8% (48) | 17.2% (10) | 50.0% (5) |
| Classroom animal dander exposure | 80.3% (53) | 24.5% (13) | 53.8% (7) |
| Bus idling policies lacking | 61.8% (42) | 38.2% (26) | 65.4% (17) |
| Water Identification Problems | 7.4% (5) | 92.6% (63) | 77.8% (49) |
| Inspections of leaks, spills, moisture | 17.7% (12) | 82.4% (56) | 66.1% (37) |
| Plumbing problems | 50.8% (34) | 49.3% (33) | 60.6% (20) |
| Roof problems | 38.8% (26) | 61.2% (41) | 73.2% (30) |
| Basement or crawlspace needs upgrading | 82.5% (52) | 17.5% (11) | 63.6% (7) |
| Removal of water-damaged materials needed | 32.4% (22) | 67.6% (46) | 71.7% (33) |
| Other Problems | | | |
| Renovations to classrooms, buildings | 60.0% (27) | 40.0% (18) | 77.8% (14) |

**Schools with Repairs or Scheduled for Repair:
Ventilation Problems or General Cleaning Improvement:
(2002 school year Student and Staff Numbers)**

TABLE 3

| # Schools | # Students | # Staff |
|-----------|------------|---------|
| 47 | 26,248* | 2,251 |

* Total # of Children with Reduced Actual or Potential Exposures

6. If **funds** are or were required for **repairs/upgrades**, how will/were they obtained?

TABLE 4

| <u>Categories:</u> | <u>Frequency</u> |
|----------------------------------|------------------|
| 1. Custodial/maintenance budget | 11 |
| 2. School/Bd of Education Budget | 27 |
| 3. Town & school budget | 7 |
| 4. State reimbursement | 1 |
| 5. Bonding/referendums | 2 |
| 6. Pending investigation | 5 |
| 7. Not required | 2 |
| 8. Unable to obtain funding | 2 |
| 9. Unknown | 1 |

7. Have any **new policies** or **committees** resulted from implementing *IAQ Tools for Schools*?

YES: 45.1% (32) NO: 54.9% (39)

8. How often has your **IAQ team** met since training took place?

- 1-2 Times: 5.3% (4)
- 3-5 Times: 6.6% (5)
- 6-10 Times: 5.3% (4)
- Have not met more than a few times: 46.1% (35)
- Monthly since training: 17.1% (13)
- Never: 6.6% (5)

9. Has the *IAQ Tools for Schools* process continued beyond the initial year of implementation?

YES: 11.1% (8) NO: 51.4% (37) “STILL IN FIRST YEAR OF IMPLEMENTATION”: 37.5% (27)

Barriers and Resources Needed (# 4 and 5):

These two questions inquired about barriers to full TfS implementation that the building teams encountered, and resources needed. As might be expected the highest number of responses concern funding. Again on Question # 14 the greatest number of respondents suggested funding as additional resources that CSIERT or EPA could provide.

4. What **major barriers** to fully implementing *IAQ Tools for Schools* still exist?

- Budget/funding: 76.1% (35)
- Lack of commitment/support: 4.3% (2)
- Time/competing priorities: 10.9% (5)

5. What **additional resources** could CSIERT and/or EPA provide?

- Additional follow-up and technical assistance: 29.6% (8)
- Funding: 48.1% (13)
- Updated materials: 7.4% (2)

Other 15, 16, 17):

Table 5 displays summarized responses to Question 15 regarding innovative interventions. In general, the responses are useful but unremarkable. As could be expected, a large number reported that it was too early to report such interventions.

As can be seen below in Question #16, the majority of respondents (60%) who answered #16 stated they were satisfied or completely satisfied with TfS so far. A substantial number (32%) were neutral or unsure, which may be a reflection of the short period of implementation.

Comments and Suggestions: The responses to Questions 17 and 21 are summarized in Table 6. These included several (12) positive comments about their progress with the TfS program. Thirty-three commented that they had only identified a minimal number of problems, or that it was too early in their TfS process to have identified problems. Nine respondents cited problems implementing the program. The comments by school nurses are addressed below.

15. CSIERT is interested in learning about innovative interventions that have been implemented as a result of the *IAQ Tools for Schools* process. Please list below any **noteworthy interventions or funding sources** your school has used to improve IAQ.

TABLE 5

| Categories: | Frequency |
|---|-----------|
| 1. Daily Custodian's Checklists | 1 |
| 2. CEA funding for project | 1 |
| 3. Comprehensive carpeting removal | 1 |
| 4. Assignment of committee members to different school sections | 1 |
| 5. Air filter change plan | 1 |
| 6. Contact with other agencies (health, environmental) | 1 |
| 7. Use of TfS program to gain support for improvements referendum | 1 |
| 8. Recognition of effectiveness of team approach | 2 |
| 9. Air purifiers | 2 |
| 10. None/N/A/Too Early to Report/Unknown | 9 |

16. How **satisfied are you** with the overall implementation of *IAQ Tools for Schools* so far?

TABLE 6

| 1 (Not at all) | 2 | 3 | 4 | 5 (Completely) |
|----------------|----------|------------|------------|----------------|
| 4.2% (3) | 4.2% (3) | 31.9% (23) | 45.8% (33) | 13.9% (10) |

17. Please feel free to offer **comments or suggestions** about *IAQ Tools for Schools* on the back of this form.

TABLE 7

| Categories: | Frequency |
|---|-----------|
| 1. TfS Implementation problems noted. | 9 |
| 2. Statements of positive progress re: TfS | 12 |
| 3. Minimal IAQ issues identified. | 12 |
| 4. Specific IAQ problems mentioned. | 2 |
| 5. Too early in TfS process to identify problems. | 11 |
| 6. Nurses: health data not collected/too soon. | 29 |
| 7. Nurses: positive assessment regarding health | 2 |

Health Questions for the School Nurse:

Another area of inquiry for the survey was whether there had been documented health changes among the school populations. A separate page of questions (below) was distributed to the school nurses to attempt to collect this information. The lack of responses Question # 20 reflect the fact that most school nurses reported that they did not systematically collect information that could be used to document these changes. This problem was cited by 29 respondents as reported in Table 7.

Two questions, numbers 18 and 19, asked for a qualitative assessment of health changes. As can be seen, most of the school nurses stated they were not sure (44%) or there was no decrease (33%) in general IAQ-related complaints. As to changes in asthma symptom reporting, the majority reported no change (60%). These findings are not surprising, given the lack of systematic collection of data, including baseline data for comparison. Another factor may be the short span of time between TfS implementation and the survey’s distribution.

18. In your opinion, has there been a decrease in the number of IAQ-related symptom complaints since *IAQ Tools for Schools* was implemented?

YES 22.7% (15) NO: 33.3% (22) Don’t Know/Not Sure: 43.9% (29)

19. In your opinion, what, if any, change has occurred in the reporting of asthma symptoms for those students with a **known asthma diagnosis** since the implementation of *IAQ Tools for Schools*?

- Increase: 1.5% (1)
- Decrease: 11.9% (8)
- No Change: 59.7% (40)
- Don’t Know/Not Sure: 26.9% (18)

20. Please provide as complete information as possible for each of the areas identified below. If data are not available for your school, provide your opinion as to whether there has been an increase, decrease or no change in each of these areas since the implementation of *IAQ Tools for Schools*.

| | Year Prior to <i>IAQ Tools for Schools</i> | Year After <i>IAQ Tools for Schools</i> |
|--|---|---|
| Number of student absences | | |
| Number of missed staff work days | | |
| Number of trips to school nurse | (See above regarding lack of response to this question) | |
| Number of times medication dispensed | | |
| - # of times asthma medication dispensed | | |
| - # times aspirin dispensed | | |
| Number of students with a known asthma diagnosis | | |

CONCLUSIONS

As mentioned earlier, the 4 principal objectives of the survey were to:

- Document IAQ problems in surveyed schools,
- Determine if schools have utilized the TfS program to make changes,
- Identify barriers faced to implementing the program, identifying and resolving IAQ problems, and
- Determine whether implementation of TfS has had an impact on health in schools.

Documentation of IAQ Problems:

As reported in Table 2, schools participating in the survey successfully utilized the TfS program to identify a number of IAQ problems. The two most frequently identified ventilation problems identified were *thermal comfort (temperature/humidity)* (45 [65%]) and *air filters needing replacing/upgrading* (36 schools [55%]). Of water problems, the most frequently identified were *leaks/spills/moisture* (56 [82%]), removal of water-damaged materials needed (46 [68%]) and *roof problems* (41 [61%]).

Overall, the results of the survey show that schools utilizing EPA's Tools for Schools program have been successful in systematically documenting IAQ problems.

IAQ Improvements Made Utilizing TfS:

As a result of utilizing the TfS program to document IAQ problems, most schools reported that they had either remediated or repaired those problems or had them scheduled for remediation or repair. As noted above, the IAQ problems with the most potential health impact are ventilation problems and poor maintenance. A large majority of the schools that identified these problems were able to rectify them: for ventilation problems, 81%, and for general cleanliness 54%. It is important for more schools reporting the need to improve general cleanliness to intervene to improve maintenance.

Schools made progress rectifying other important IAQ problems. Many schools identified problems with water incursion, the key reason for biological contaminants like mold. Seventy-eight percent of those schools identifying a water or moisture problem were able to have these problems remediated or scheduled for remediation. Many schools identified bus idling as a problem. Sixty-two percent of schools identifying this problem had intervened to address this problem.

Barriers Encountered:

As might be expected, the main barrier cited to full implementation of the TfS program is the need for increased funding resources. Many of the causes of poor school IAQ, such as water incursion, poor maintenance, and ventilation problems, are the result of a lack of funding resources. Although TfS can address many – or often most – IAQ problems encountered by schools, school districts may need funding to address higher cost interventions. In particular, maintenance outlays are often cut back first when school boards enact budgets.

In addition, it is important to note that CSIERT, EPA and other agencies and organizations familiar with the TfS process cite parental involvement on the TfS building teams as a key to effective implementation. A significant number of schools (approximately 25 %) reported that they did not have parents on the team. Furthermore, a number of these schools reported the reason for no parent involvement was an administrative decision. Parents can be a key part of the communication process that is one of the most important components to ensure the success of the TfS program.

Health Impact on Schools:

A final objective of the survey was to attempt to collect quantitative (and qualitative) data that might document actual health changes among building occupants, particularly children. This was attempted through the list of questions to be answered by the school nurse. As reported above, virtually all of the school nurses reported that they did not systematically collect information that could be used to document these changes. This may change with a new mandate for school nurses to document asthmatic students in Connecticut schools. Nurses stated they would report such information if they were asked to collect such data.

However, it is important to recognize that the survey presents positive outcome measures documenting that IAQ problems in schools are being identified and remediated as a direct result of TfS implementation. Literature and studies show the link between these same IAQ problems and health problems (sick building syndrome, asthma episodes, etc.). Therefore we can infer that rectifying IAQ problems will reduce or prevent health problems. Based on the interventions reported by the 47 schools in Table 3, there are a large number of students (as many as 22,000) and staff (2,251) who are benefiting from improved ventilation and cleanliness. In addition, a substantial number of schools(49) reported remediation efforts

regarding water problems. It can be inferred that children and staff in those schools are likely to have benefited from these interventions.

RECOMMENDATIONS

- 1) The results of this survey should be made known to Connecticut school administrators and staff, state and local policy makers, and parents.
- 2) All schools in Connecticut should adopt and maintain EPA's Tools for Schools program. The findings of this survey indicate TfS to be an effective intervention. The program also addresses part of the requirements of the 2003 School IAQ Act (Public Act No. 03-220).
- 3) Schools that have adopted TfS should actively maintain their program after the initial year of implementation. CSIERT should provide support to ensure this recommendation.
- 4) Connecticut school districts should make sure adequate resources are available to provide regular maintenance in their schools. There is a direct connection between poor maintenance and poor IAQ in schools.
- 5) School nurses and other school medical staff should collect relevant health data for assessing IAQ problems and improvements. These data might include student and staff absences, number of school nurse visits, nebulizer use, and specific complaints about IAQ.
- 6) Parental involvement in the Tools for Schools process is very important to the success of the program. All TfS building teams should have at least one parent member. The local PTA organization should be regularly informed about TfS assessments and recommendations.

References:

- (1) CT Academy of Science and Industry (CASE), Indoor Air Quality in Schools, July 25, 2000

2003 Indoor Air Quality (IAQ) Tools for Schools Evaluation (Attachment C)
 Connecticut School Indoor Environment Resource Team (CSIERT)

SCHOOL _____ CITY/TOWN _____

- Elementary Middle School High School Other:

IAQ COORDINATOR (S) _____ PHONE _____ E-MAIL _____

- School Nurse Facility Mgr. Administrator Teacher Parent Other:

6. Did your school complete **both** of the *IAQ Tools for Schools* trainings (Introductory 3hrs & Walkthrough with Industrial Hygienist)?
 YES Dates Completed: Introductory ____/____/____ Walk thru ____/____/____
 NO
7. Did your school have an **IAQ management plan** or **health and safety team** that addressed IAQ **prior** to *IAQ Tools for Schools* trainings?
 YES NO
8. What were the **motivating factors** to implementing *IAQ Tools for Schools* at your school?
9. Which **IAQ Coordinator Checklist steps** have been **completed** to date? (*Please check*)
- | | |
|--|--|
| <input type="checkbox"/> All Steps Completed | <input type="checkbox"/> Assess Asbestos Status |
| <input type="checkbox"/> Distribution of Action Packets | <input type="checkbox"/> Assess Radon Status |
| <input type="checkbox"/> Checklist Log | <input type="checkbox"/> Assess Lead Status |
| <input type="checkbox"/> Checklists Collected & Summarized | <input type="checkbox"/> Prioritize Repairs & Upgrades |
| <input type="checkbox"/> Review School Blueprint | <input type="checkbox"/> Develop & Distribute Summary Report |
| <input type="checkbox"/> Assess Pest/Pesticide Status | <input type="checkbox"/> Establish or Update School IAQ Policy |
10. Which **IAQ problems** have been identified, repaired, or scheduled for repair? (*Please check all that apply*)

| | NO PROBLEM IDENTIFIED | IDENTIFIED | SCHEDULED FOR REPAIR | REPAIRED |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| VENTILATION PROBLEMS | | | | |
| Obstructions from air vents | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Filters need upgrading or replacing | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| HVAC units & ventilators need cleaning | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Temperature/dryness/humidity need improving | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Arts/sciences room needs ventilating | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Outdoor air intakes need improving | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| SOURCE REDUCTION PROBLEMS | | | | |
| Radon remediation needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Asbestos remediation needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cleaning products need replacing with "greener products" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| General cleaning improvement needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Carpet cleaning or removal needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pests or pesticide use remediation needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Arts/science materials need replacing with "greener products" | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Classroom animal dander exposure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Bus idling policies lacking | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| WATER IDENTIFICATION PROBLEMS | | | | |
| Inspections of leaks, spills, moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Plumbing problems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roof problems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Basement or crawlspace needs upgrading | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removal of water-damaged materials needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| OTHER PROBLEMS | | | | |
| Renovations to classrooms, buildings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other (specify) _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other (specify) _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other (specify) _____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

THE FOLLOWING QUESTIONS SHOULD BE ANSWERED BY THE SCHOOL NURSE.

As you know, common symptoms that can be related to IAQ include headaches, stuffy/runny nose, lethargy, dizziness, nausea, and breathing difficulties. Please keep these symptoms in mind as you answer the following questions.

23. In your opinion, has there been a decrease in the number of IAQ-related symptom complaints since *IAQ Tools for Schools* was implemented?
 YES NO Don't Know/Not Sure

24. In your opinion, what, if any, change has occurred in the reporting of asthma symptoms for those students with a **known asthma diagnosis** since the implementation of *IAQ Tools for Schools*?
 Increase Decrease No Change Don't Know/Not Sure

25. Please provide as complete information as possible for each of the areas identified below. If data are not available for your school, provide your opinion as to whether there has been an increase, decrease or no change in each of these areas since the implementation of *IAQ Tools for Schools*.

| | Year Prior to <i>IAQ Tools for Schools</i> | Year After <i>IAQ Tools for Schools</i> |
|--|--|---|
| Number of student absences | | |
| Number of missed staff work days | | |
| Number of trips to school nurse | | |
| Number of times medication dispensed | | |
| - # of times asthma medication dispensed | | |
| - # times aspirin dispensed | | |
| Number of students with a known asthma diagnosis | | |

26. Please list any additional comments.

CSIERT is very interested in receiving media coverage, newsletters, articles, and summary reports from the committees for our files and as educational examples. Please include such items when you return this survey.

Please enclose survey with copies of TfS Committee **reports** to:
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Hartford, CT 06134-0308