A. Brief Description of the Issue:

Research articles dating back as far as 2000 have clearly chronicled the problem associated with inadvertent exposure of horses to substances in the environment. Common sense would dictate that trace amounts of substances transferred to horses through means beyond the trainer’s control such as recycling from stall contamination, or trace contact such as an identifier or assistant starter handling the lips of a horse have no impact on the physiology of the animal and hence no impact on its racing performance. Such common sense has been applied in the human drug testing arena, with the Department of Transportation, the Federal Aviation Administration and the Nuclear Regulatory Commission adopting screening levels developed by SAMHSA. With the advent of extremely sensitive testing equipment currently in use in horse racing, these trace positives are becoming commonplace, unfairly penalizing innocent horsemen and blemishing the reputation of horse racing across the board. The NAARV and NHBPA have deep concerns about this development and believe that screening levels can readily be adopted to mitigate this developing problem.

B. Discussion of the Issue and Problem

Provide background on the issue to build context. Address the following:

1. What specific problems or concerns are involved in this issue?

Positive tests for substances of human recreational use are being called at levels consistent with trace inadvertent contact exposure, well below any possible effect on the animal, penalizing innocent trainers and owners.

2. Who does the issue affect?

All stakeholders in the Industry: Trainers who suffer penalties through no fault of their own, affected owners are penalized with purse redistribution, fans are disenfranchised because horses may be
disqualified creating an illusion that the “drug positive” for traces levels of human recreational substances changed the outcome of the race, taxpayers are forced to spend tax dollars enforcing an unenforceable regulation

3. What existing model rules relate to this issue?

**ARCI-011-020 Medications and Prohibited Substances**, Section H. *Environmental Contaminants and Substances of Human Use*, Subsection (2) states: *Substances of human use and addiction may be found in the horse due to its close association with humans.* This section references the ARCI *Endogenous, Dietary, or Environmental Substances Schedule*. This model rule proposal seeks to add three common Substances of Human use and addition to the schedule.

4. Provide relevant quantitative or statistical information if possible.

1. Morphine:
   a. Drug Class: narcotic
   b. Therapeutic Uses:
      i. Used in the amelioration of pain, predominantly in humans, but also has recognized uses in horses
   c. Threat to Racing Integrity:
      i. In proximity to racing, morphine is a potent pain-killer and could allow a horse to race that is unfit. Horses also respond to morphine with a hyperactivity or “upper” phase, which could act as a “hop”. The levels required for these effects are substantial.
      ii. Used out of competition for pain relief: none.
   d. Environmental sources:
      i. Hay: Hay has been identified as a source of morphine in amounts sufficient to produce concentrations in cow’s milk as high as 0.2 ng/mL¹.
      ii. Poppies: Morphine is a component of poppies, and while it is harvested from the Opium Poppy, it may be present in small quantities in many species of poppies, and some opium poppies actually may be found infiltrating hay and grain fields.
      iii. Poppy seeds: Morphine can be identified readily in the urine of humans and horses after the consumption of bakery products containing poppy seeds. Some feed mills may use bakery “sweepings” which are the left over baking materials from bakeries as fillers in their horse feeds.
      iii. Human urine: Humans who consume morphine or prescription narcotics such as codeine therapeutically or recreationally excrete large quantities of glucuronidated morphine in their urine. It has been demonstrated that horses readily consume urine-contaminated hay, and drugs that may be in the hay.
   e. Other sources:
      i. Morphine is actually an endogenous substance, and may be produced by the animal
   f. Reasonable screening level
      i. SAMHSA screening level

a. SAMHSA has determined that a **2000 ng/mL morphine in urine** safely prevents unfairly penalizing an individual, and also precludes any effect on the person tested. These recommendations have been adopted by the FAA, DOT and NRC.

b. Using this method, and applying typically used dosages for clinical efficacy (15 g twice daily), the effective plasma concentration (EPC) can be calculated at 2.5 mcg/mL.

ii. Internationally recognized screening level
   a. The International Federation of Horseracing Authorities (IHFA) has recognized the problems associated with inadvertent environmental exposure to substances used both therapeutically and recreationally by humans, and adopted a screening level of **30 ng/mL morphine in urine** in horses, well below the level that can be achieved by the consumption of poppy seeds\(^2\).

iii. Alternative recommendation
   a. Because of the possibility of contamination of natural feedstuffs with poppies, even aside from the risks of human contamination, and the finding that 10 g of bakery sourced poppy seeds can cause as high a urinary level as 213 ng/mL, the adoption of a screening level of **250 ng/mL of morphine in urine**, a quarter of the level used by the FAA, DOT and NRC, would prevent the inappropriate penalization of horsemen and owners without risk to the integrity of horse racing.

iv. Morphine ARCI violations
   a. There have been 9 violations over the last three years.

2. Amphetamine/methamphetamine:
   g. Drug Class: stimulant
   h. Therapeutic Uses:
   i. Methamphetamine is available as the dextro- or d- form as Desoxyn \(^6\) for the treatment of Attention Deficit Hyperactivity Disorder (ADHD) for humans, no recognized therapeutic use in horses. Amphetamine is available as a racemic mixture of both d- and levo- or l- forms as Benzedrine\(^6\), or Adderal\(^6\) for the treatment of ADHD, narcolepsy and some forms of epilepsy in humans.
   ii. There are well established blood levels associated with therapeutic effect in humans for ADHD\(^3\):
      a. Amphetamine: 20-30 ng/mL blood
      b. Methamphetamine: 10-50 ng/mL blood

i. Threat to Racing Integrity:
   i. In proximity to racing, stimulants could be used to improve performance.
   ii. Used out of competition: inappropriate for any use in the horse.

j. Environmental sources:
   i. Human urine: Humans who consume amphetamine or methamphetamine therapeutically or recreationally excrete large quantities of these stimulants in their

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\(^3\) http://www.clr-online.com/CLR2017-13_Table-of-Cutoff-Toxicity-DOA.pdf
Methamphetamine is highly stable in the environment, remaining in the environment for years.

ii. Casual contact: It has been suggested that methamphetamine users with trace amounts of drug on their hands can transfer this substance to horses, either by contact with a tongue tie, or direct contact with the horse’s tongue, such as occurs in the starting gate with assistant starters. Further, in a recent publication by Brewer et al., inadvertent environmental exposure of horses to a horse trailer which had been previously used as an illicit methamphetamine laboratory triggered trace level positives in a group of race horses.

k. Reasonable screening level
   iii. SAMHSA screening level
      a. SAMHSA has determined that a **500 ng/mL in urine** safely prevents unfairly penalizing an individual, and also precludes any effect on the person tested. These recommendations have been adopted by the FAA, DOT and NRC.
   iii. Published screening level
      a. The Brewer paper reasonably suggests a **screening level of 15 ng/mL in urine** for methamphetamine.
   iv. Methamphetamine ARCI violations
      b. There have been 39 violations over the last three years. Of those violations, most, if not all have been below the suggested screening level of 15 ng/mL.

3. Cocaine:
   l. Drug Class: stimulant
   m. Therapeutic Uses:
      iii. Cocaine is rarely used as a mucosal local anesthetic in humans, with no recognized therapeutic use in horses.
      iv. There are established blood levels associated with therapeutic effect in humans.
   n. Threat to Racing Integrity:
      v. In proximity to racing, stimulants could be used to improve performance.
      vi. Used out of competition: inappropriate for any use in the horse.
   o. Environmental sources:
      iv. Human urine: Humans who consume cocaine therapeutically or recreationally excrete large quantities of these stimulants in their urine, predominantly as benzylecgonine (BZE).
      v. Casual contact: Humans who may contact lips or other mucosal surfaces of horses, such as identifiers and assistant starters may transfer trace quantities of cocaine to race horses.
   p. Reasonable screening level

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vi. SAMHSA screening level
   a. SAMHSA has determined that a **300 ng/mL of BZE in urine** safely prevents unfairly penalizing an individual, and also precludes any effect on the person tested. These recommendations have been adopted by the FAA, DOT and NRC.

vii. Published screening level
   a. Seven jurisdictions have established screening levels that range from **50 to 150 ng/mL in urine**, 1/6 to ½ of the human level of 300 ng/mL. Setting a screening level of 150 ng/mL is consistent with several racing jurisdictions and well below the human screening level.
   b. 50 ng/mL urine: Minnesota, Washington
   c. 100 ng/mL urine: Florida
   d. 150 ng/mL urine: Illinois, Ohio, Louisiana

viii. BZE ARCI violations
   a. There have been 18 violations over the last three years.

4. Evidence for inadvertent environmental contamination of substances
   a. The transfer of trace amounts of substances in the environment to horses in sufficient quantities to trigger positive drug tests has been unequivocally demonstrated for:
      i. Flunixin\(^6,7\)
      ii. Naproxen\(^8\)
      iii. Ibuprofen\(^9\)
      iv. Meclofenamic Acid\(^10,11\)
      v. Isoxsuprine\(^12\)
   b. The transfer of trace amounts of substances eliminated in urine (human or equine) in sufficient quantities to trigger positive drug tests has been unequivocally demonstrated for:
      i. Flunixin
      ii. Naproxen

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c. The presence of trace amounts of substances in the environment of horses has been demonstrated for (Figures 1 – 3):
   i. Naproxen
   ii. Glycopyrrolate
   iii. Flunixin
   iv. Acepromazine
   v. Ketoprofen
   vi. Lidocaine
   vii. Ranitidine
   viii. Firocoxib
   ix. Isoxsuprine
   x. Omeprazole
   xi. Methocarbamol
   xii. Guaifenesin
   xiii. Metoprolol
   xiv. Methadone
   xv. Meprobamate
   xvi. Tramadol
   xvii. Metformin
   xviii. Dextrophan
   xix. Nicotinamide (nicotine)
   xx. Ritalinic Acid
   xxi. Oxycodone
   xxii. Methamphetamine
   xxiii. Cocaine and its metabolites

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14 Chambers A. Supplemental report
Figure 1 (courtesy of M Catignani of Charlestown HBPA): Receiving Barn Stalls Swabbed at Charles Town, tested for Human prescription medications.

![Human Medications Detected](image)

Figure 2 (courtesy of M Catignani of Charlestown HBPA): Receiving Barn Stalls Swabbed at Charles Town, tested for Equine therapeutic medications.

![Equine Medications Detected](image)
C. Possible Solutions and Impact

*Provide possible recommendations to solve the problem. Include details on each proposed*

i. **Conclusion:**
   a. The increasing sensitivity of drug testing in horse racing has resulted in an inordinate number of inadvertent environmental exposure violations beyond the control of the trainers, destroying careers and threatening the absolute insurer rule.
   b. We request that the RCI Model Rules Committee recommend establishing a new section of the Model Rules, establishing cutoff or screening levels for these common substances of human abuse, mirroring the SAMHSA list.
   c. We request a review by the RCI scientific advisory committee of our proposed thresholds.
   d. Relying on International standards, published literature, and established levels already adopted in various jurisdictions, we propose minimal urinary thresholds as follows:
      i. Morphine: 30 ng/mL urine
      ii. Methamphetamine: 15 ng/mL urine
      iii. BZE: 50 ng/mL urine
   e. Since some jurisdictions already have established screening limits in place based on both clinical and regulatory experiences. There may be specific reasons that
higher levels are reasonable. The higher limits supported by published literature and already established screening limits are:

i. Morphine: 250 ng/mL urine
ii. Methamphetamine: 100 ng/mL urine
iii. BZE: 150 ng/mL urine

• What solution does this proposal provide?
  Recognition that inadvertent environmental exposure occurs, results in no physiologic effect on the animal, and must be accounted for in the regulation of horse racing to protect the integrity of racing and preserve its reputation.

• How will the solution fix the problem?
  This will prevent jurisdictions from unfairly penalizing trainers and owners for inadvertent environmental exposure and negatively impacting the perception of the sport for trace positives that do not adversely impact the integrity of racing, as previously recommended by ARCI-011-020 § H(2). The proposed interim screening levels are well below those levels accepted in human drug testing, providing a large margin of safety that prevents any possible intentional use of these substances.

• How will the change affect any entities or stakeholders?
  This will impact owners and trainers by preventing penalties associated with inadvertent environmental exposure, and save horsemen and regulators in legal expenses associated with the defense of these positive tests.

• How will you or your organization be affected by the proposed change?
  Veterinarians and horsemen can carry on with their work of caring for horses without being concerned about the negative impact on the perception of the sport, and alienating owners in the sport.

• What are the benefits of the proposed change?
  Fewer spurious positive tests reported over which the horsemen have no control.

• What are the possible drawbacks of the proposed change?
  None.

• Identify possible fiscal impact of the recommended change.
  Horsemen will retain purses legitimately earned, reputations will not be marred, which would impact the ability of those horsemen to attract clients going forward, racing commissions and horsemen would spend less money on litigation to defend drug overages, drug overages would be less evident in the media, negatively impacting the perception of the sport.

D. Industry Support

Please identify any affected stakeholder groups that expressed support or opposition.

Dionne Benson of the RMTC has expressed concern that setting screening levels for Class 1 and 2 drugs is a tacit approval and tantamount to providing guidance for the use of these drugs. The screening
levels we have proposed are well below those in use for humans for the FAA, DOT and NRC, and in no way are consistent with any possible intentional administration. Therefore, there is no risk of any intentional administration that might have any remote effect. This is simply a necessity as drug testing becomes more sensitive.

NHBPA and NAARV are in support.

**E. Proposed Model Rule language**

*Attach the model rule language you are proposing.*

This proposal adds the following to the **ARCI Endogenous, Dietary, or Environmental Substances Schedule**:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Screening Threshold/Cutoff</th>
<th>Alternate Threshold/Cutoff</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>50 ng/mL in urine</td>
<td>250 ng/mL in urine</td>
<td>Human Use and Addiction, Endogenous, Exogenous dietary</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>15 ng/mL in urine</td>
<td>100 ng/mL in urine</td>
<td>Human Use and Addiction</td>
</tr>
<tr>
<td>BZE</td>
<td>50 ng/mL in urine</td>
<td>150 ng/mL in urine</td>
<td>Human Use and Addiction</td>
</tr>
</tbody>
</table>

**F. Similar State Rules**

*Do any racing jurisdictions currently have a version of this rule in effect?*

Morphine (at least one jurisdiction has an unpublished threshold, KY):

<table>
<thead>
<tr>
<th>Medication</th>
<th>Conc.</th>
<th>Fluid</th>
<th>Jurisdiction</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morphine</td>
<td>100 ng/ml</td>
<td>urine</td>
<td>Oklahoma</td>
<td>2010</td>
</tr>
<tr>
<td>Morphine</td>
<td>50 ng/ml</td>
<td>urine</td>
<td>Minnesota</td>
<td>2010</td>
</tr>
<tr>
<td>Morphine</td>
<td>50 ng/ml</td>
<td>urine</td>
<td>Ohio</td>
<td>present 1999, updated 2011</td>
</tr>
<tr>
<td>Morphine</td>
<td>50 ng/ml</td>
<td>urine</td>
<td>Washington</td>
<td>2008</td>
</tr>
<tr>
<td>Morphine</td>
<td>120 ng/ml</td>
<td>urine</td>
<td>Louisiana</td>
<td>2011</td>
</tr>
<tr>
<td>Morphine</td>
<td>&lt; LOD</td>
<td>blood</td>
<td>Louisiana</td>
<td>2011</td>
</tr>
</tbody>
</table>

(Tobin et al., 2012)\(^{15}\)

Methamphetamine:

<table>
<thead>
<tr>
<th>Medication</th>
<th>Conc.</th>
<th>Fluid</th>
<th>Jurisdiction</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methamphetamine</td>
<td>100 ng/ml</td>
<td>Urine</td>
<td>Oklahoma</td>
<td>2015?</td>
</tr>
</tbody>
</table>

Cocaine (BZE):

<table>
<thead>
<tr>
<th>Medication</th>
<th>Conc.</th>
<th>Fluid</th>
<th>Jurisdiction</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzoyleconine</td>
<td>150 ng/ml</td>
<td>Urine</td>
<td>Illinois</td>
<td>2011</td>
</tr>
<tr>
<td>Benzoyleconine</td>
<td>150 ng/ml</td>
<td>urine</td>
<td>Ohio</td>
<td>1999, updated 2011</td>
</tr>
<tr>
<td>Benzoyleconine</td>
<td>150 ng/ml</td>
<td>urine</td>
<td>Louisiana</td>
<td>present 2009, updated 2011</td>
</tr>
<tr>
<td></td>
<td>&lt; LOD</td>
<td>plasma serum</td>
<td></td>
<td>2011</td>
</tr>
<tr>
<td>Benzoyleconine</td>
<td>150 ng/ml</td>
<td>urine</td>
<td>Pennsylvania</td>
<td>2009</td>
</tr>
<tr>
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<td>50 ng/ml</td>
<td>urine</td>
<td>Minnesota</td>
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<td>urine</td>
<td>Washington</td>
<td>2008</td>
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<td>Benzoyleconine</td>
<td>100 ng/ml</td>
<td>urine</td>
<td>Florida</td>
<td>2009</td>
</tr>
</tbody>
</table>

(Tobin et al., 2012)

G. Review and Identification of affected Model Rules

*Review the RCI Model Rules and identify any other Model Rules this change would affect and submit proposed amendments to those rules to comply with changes that would be made by this proposal.*

No additional Model Rules are affected. All applicable sections already refer to the current version of the ARCI Endogenous, Dietary, or Environmental Substances Schedule.