Gregory P. Perreault

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= ^*20\% L\%2^*A! C0! < !^* (++(&20'-)DJ!EFGFJI02!P\&\#\$K!'' \#\$1\$012; !P\&*0\#\$0\%20!N\#; \#: \ ^*25,! \\ P\&1418\#; 12; !'*4\#\&\%; \#!12!\&\#81; 1*2!\&\#/*\&012; 0 \\ ! \\ ^* (++(&20'-)D-)?\%2. *'A!D\&0A!C0! < !>\%L\#\&8*2A!f0!EFGFJK!f16\#!\%60\#\&!. <math>\#\%0(,!RL10+\%&1\#\$!\%\$! : \#0\%/*+\&2\%1\$01'!. 1\$'*+\&\$\#0!
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7(**012;\$0! O!H[AEJK,!Hh IH[JO! (00/\$,ee. *10*&; eHG0HH__eHZJHFhJHFFHHHHJ^G! $(++(&20'-)DJ) = **2A!" (A!) \%; #2! \times \% (A!D0! < !P#&&#%+80A! = 0!EFGFFK!q000$!$ **4***0! (%0#A!L+0000q!) * (%0*A!L+0000q!) * (%0*A!L+0000q!)W#61212;!: %&;12%!'%0#;*&1#\$!12!&+&%8!V*+&2%81\$: 0! *2812#!/+L81'%01*20!(00/\$,ee. *10*&; eHG0HG^GeH THF ^[0FGFF0FG T ^F) * (++(&20'-)DJ-)D* (2\$*2A!@0A! <!C8#12A! F0!EFGFFK! > * 4#&12; !N%0#,!) 1#8. !? (#*&5!%2. ! D*+&2%1\$01'!'' *8#!>*2'#/01*2!12!0(#!>*4#&%;#!*6!X(10#!Y%01*2%81\$0!'' %881#\$0! O!H[AE[K,!HHH IHHJJO! (00/\$,ee. *10*&; eHG0HG^GeH THF ^[0FGFG0H^JTTFT) * $(++(&20'-)DJ! < !=#80`#&A! \subset 0!EFGFFK! = #0\%V* + &2\%0!$01' !. 1$' * + &$#!\%2 . !&#/*_&0!12; !/*81' 1#$!*2!$ B(10#!2%01*2%81\$: 0! 0! - . 4%2' #. !*2812#!/+L81'%01*20! (00/\$,ee. *10*&; eHG0HH__eGHZ[^TZZFHHG_FhTF! * (++(&20'-)D0!<!@#88A!?0!EFGFFK!?*B%&.!%!p.1;10%q!\$/*&0!V*+&2%81\$: ,!)1#8.!0(#*&5A! '(%2;12;!L*+2.%&1#\$!%2.!#4*8412;!0#'(2*8*;1#\$0! 0!HGAEJK,! JZ^IhH[0!(00/,ee. *10*&; eHG0HH__eFH[_h_ZTFGZ_ZZT^) * (++(&20'-)DJ-)P#&&#%+80A! = 0! < ! = %%&#\$A!P0!EFGFFK! = #0%V*+&2%01\$01' !. 1\$' *+&\$#!%\$!%!\$0%L181` #&! B10(12!0(#!V*+&2\%1\\$01'!61\#8. ;!D*+&2\%1\\$01'!/\&\"01'\#!12!0(\#!>RMQWIHZ!/\%2.\#: 1'0! 0!H[AEFIJK,!J[TIJ^J0! (00/\$,ee. *10*&; eHG0HG^GeH_THF_^[0FGFH0HZhZ[JG! *(++(&20'-)D0A!P#0#&\$A!D0A!D*(2\$*2A!@0!<!C8#12A!f0!EFGFHK!N*B!D*+&2%8\$0\$!?(12d!-L*+0!)0(#!)1&\$0!-: #2.: #20!M1\$IrIM1\$!?(#1&!>*4#&%;#!*6!N%0#!\b&*+/\$0! 0!HTAEFGFHK0!

)#&&+''1A!P0!<!*(++(&20'-)DJ!EFGFHK!?(#!81%L18105!*6!2#B2#\$\$,!D*+&2%81\$: A!122*4%01*2!%2.!

0!FFAEHHK0!

0(#!1\$\$+#!*6!'*&#!'*: /#0#2'1#\$0!

* (++(&20'-)D0! <!) #&&+' '1A!P0!EFGFGK! \times (%)!1\$!W1; 10%!D*+&2%1\$: k!W#61212; !0 (#!P&%'01' #!%2 . ! " *8#!*6!0 (#!W1; 10%!D*+&2%81\$00 !^EHGKA!HFZ^I

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!N#&$ (#5A!P-,!
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QbQ!b8*L\(\text{\text{00}}\),ee. *10*&; eHG\(\text{0}\)HI[[^hI_T^ZI^0' (G[F! P#&#%+&OA! = 0! < !*(++(&20'-)DJ!EFGFGK! = *L18#!b%: 12;!70&%0#;1'!>*: +21'%01*2!%2.!) #&!*6! = 1\$\$12; !R+0!E) * = RK!12!) %2! > +80+8#,!-!> %\$#!70+. 5!*6!) 12%!) %20%\$5!@8%4#!CU41+\$0! 0!W+22A!-0!EC.0K!N#&\$(#5A!P-,!)0b0!b8*L\\\\\! |...| | P#&&#%+80A! = 0! < !* (++(&20'-)DJ!EFGFJK! = *L18#!b%: 12; !70&%0#; 1'! >*: +21'%01*2!%2.!)#%&!*6!=1\$\$12;!R+0!E)*=RK!12!)%2!>+80+&#,!-!>%\$#!70+.5!

*6!)12%!)%20%\$5!@&%4#!CU41+\$0! !N#&\$ (#5A!P-,!QbQ!b8*L\\(\text{\text{W0!}}\)(00/,ee. \(^10\)*&; eHG\(^10\)HI

[[^hI T^ZI^0' (G^G!

(++(&20'-)DJ!<!=+#8#&A!?0!EFGFGK!X(!8*4#\$!0(#!@1L81'%!C/1'k!-!: 1U#. I: #0(*.!))%2%85\$1\$!*6!*2812#!'*: : +2105!/#&'#/01*2!*6!#/1'!@1L81'%8!: *41#\$0! $!>8\%50*2A!\times0!EC.0K!=\%2'(\#\$0\#\&A!)$

 $3c_{1}3214\#\$\$105!*6!=\%2'(\#\$0\#\$!P\$\#\$\$0!$

* (++(&20'-)DJ!<!f%+; (\$12A!>0!EFGHZK!-: #&1'%2!#4%2;#81'%8!;%: 12;!'+80+&#,!-!'%\$#!\$0+.50! !70+8;188A!-0!<!>(#2A!>0!EC.0K!7%20%!@%&L%&%A!>-,!P&%#;#&0!

P # & & # % + 80 A! = 0 A! * (++ (& 20'-) DJ

- f52' (A!?OI:C&U#8L#2A! = 0! <!* (++ (&20'-)DJ!EFGFFK!? (&#%0!%2.!C2(%2' #: #20,!700(!*6!b%: #&! 0. #20105! = *. #&%0#\$! 66#' 014#!'' #\$/*2\$#!0*! = #\$\$%; #\$!%L*+0!b%: 12; 0!FGFF!Y%01*2%! >*: : +21' %01*2! \$\$*' 1%01*20!Y#B!R&&#%2\$A!ff*+1\$1%2%0!!
- * (++(&20'-)D-)?%2. *'A!D&0A!C0!<!>%L#&8*2A!f0!EFGFFK!f16#!%60#&!. #%0(,!RL10+%&1#\$!%\$!: #0W*+&2\\$1\\$01'!

 . 1\\$' *+&\\$#0!FGFF!-\\$\\$' 1\%01*2!6*&!C. +'\%01*2!12!D*+&2\\$1\\$: !<!=\\$\\$!>*: +21'\%01*20!\W\#0&*10A!

 =1' (1; \%20!
- * (++(&20'-)DJ! <! = 188#&A! \bigcirc 0!EFGFFK! \times (#2!V*+&2%81\$0\$!%&#!4*1'#8#\$\$,!N*B!816#\$058#!V*+&2%81\$0\$!'*4#&! (%0#!%2.!: 101; %0#! (%&%\$\$: #200!FGFF!-\$\$*'1%01*2!6*&!C.+'%01*2!12!D*+&2%81\$: !<!=\\$\$! >*: +21'\%01*20!W#0&*10A!=1' (1; \%20!
- * (++(&20'-)DJ)<!N%2+\$' (A!) 0!EFGFFK!Y*&: %81`12;!02\$0%; &%: 0!FGFF!020#&2%01*2%!>*: : +21'%01*2! - \$\$*'1%01*20!P%&1\$A!) &%2'#0!
- * (++(&20'-)DJ)Q)

- C%2%2*41' (A!M0! <!* (++(&20'-)DJ!EFGFGK! +. 1#2' #!%\$!@*+2. %&5! X *&d#&,!W#' *2\$0&+' 012; !0 (#!>YY! f14#!@&*%. '%\$0!6&*: !0 (#!7%2!@#&2%&. 12*!7 (**0#&\$a! /%&0: #200!FGFG! \$\$*' 1%01*2!6*&! C. +' %01*2!12!D*+&2%1\$: !%2. != %\$\$!>*: +21' %01*20!M1&0+%!>*26#' #0!7%2!) &%2' 1\$' *A! >%816*&21%0!
- * (++(&20'-)DJ! < !f52' (A!?0!EFGFGK!W1\$' *+&\$#!*6!b%: 12;!?(#*&5,!N*B!b%: #&\$!X*&d!%\$!%2! 020#&/#!>*:: +21050!FGFG!020#&2%01*2%!>*:: +21'%01*2!-\$\$*'1%01*20!M1&0+%!>*26#'#0!75.2#5,!-+\$0&%01%!!
- * (++(&20'-)DJ)70%261#8. A!C0!<!f+00: %2A!70!EFGHZK!pX (5!0 (#! (tt8!. *!V*+&2%81\$0\$! (%4#!%!X (10#!N*+\$#! P&#\$\$!>*&&#\$/*2. #20\$a!W122#&k!) 1#8. !? (#*&5!%2. !'' *8#!>*2' #/01*2!12!P*8101' %8!D*+&2%81\$: 0! FGHZ!-\$\$*'1%01*2!6*&!C. +'%01*2!12!D*+&2%81\$: !%2. !=%\$\$!>*: +21' %01*20!?*&*20*,!>%2%. %0!
- * (++(&20'-)DJ)<!=#80`#&A!C0!EFGHZK!''#/*&012;!N%0#,!=#0\%*+&2\%1\\$01'!. 1\\$'*+&\\$#!\%2. !\&#/*\&012;! /*81'1\\$!*2!0(\\$!\g\\\801\&1; (00g!FGHZ!\020\\$\&2\\%1*2\\82\\81\>*: +21'\\%01*2!-\\$\\$*'1\\%01*20!\X\\\$\(12;0*2\\81\) \\\W0>0)
- P%+&I\Y0!<)* (++(&20'-)D0!EFGHZK!P1'0+&12; !0 (#!P&#\$1. #20,!M1\$+\&I\%2\%5\$\$1\$!*6!0 (#!W*2\%. !?\&+: /! /\&#\$1. #2'5!*2!3070!: \%;\%`12#!'*4#\&\$!L#0B##2!FGH[!\%2. !FGH^0!FGHZ!-\$\\$*'1\%01*2!6*\&! C. +'\%01*2!12!D*+\&2\%1\\$: !\%2. !=\\\$\$!>*: +21'\%01*20!?*\&*20*.!>\%2\%. \%0!
- * (++(&20'-)DJ)EFGHZK!Y%&&%014#!6&%: 12;!*6!Q1*2!12!;%: 12;!V*+&2%81\$: 0!FGHZ!Q20#&2%01*2%! >*: +21'%01*2!-\$\$*'1%01*20!X%\$(12;0*2A!W0>0)
- >&%B6*&. A! = 0! <) * (++(&20'-)DJ)EFGHZK!7/*&0\$!V*+&2%I\$0\$!*2!'*4#&12; !B*: #2a\$!\$/*&0\$,! = #0\%V*+&2\%I\$01'!\%1\\$'*+&\\$#!*2!0(#!&*\\$#!*6!B*: #2!12!\\$/*\&0\\$!\%2.!\\$/*\&0\\$!\&#/*\&012; 0!FGHZ! 020#\&2\%01*2\\%!>*:: +21'\%01*2!-\\$\\$*'1\%01*20!\X\\\$(12;0*2\MV0>0)
- * (++(&20'-)DJ)<!M*\$A!?0!EFGH^K!?&%. 101^2 2%!V*+&2%1\$0\$!*2!;%: 12; !V*+&2%1\$: ,!=#0\%'+&2\%1\$01'! . 1\$' *+&\$\#!*2!0 (\#!&1\$\#!*6!\%16\\$058\#!V*+&2\%1\$: 0!FGH^!-\$\\$*'1\%01^2!6^*&!C.+'\%01^2!12!D*+&2\%1\$: ! \%2.!=\\$\\$!>*: : +21'\%01^220!\X\\$(12;0^22\!W>0!!
- * (++(&20'-)DJ)<!?(%: A!70!EFGH^K!?(#!C66#'0\$!*6!) 8*B!12!=*L18#!b%: 12;,!024*84#: #20A!7/#2.12;!

 P&%'01'#\$A!%2.!-0010+.#0!FGH^!-\$\$*'1%01*2!6*&!C.+'%01*2!12!D*+&2%11\$: !%2.!=%\$\$!

 >*:: +21'%01*20!X%\$(12;0*2A!W>0))
- * (++(&20'-)DJ)<!=+#8#&A!?0!EFGH^K!X(*!8*4#\$!0(#!@1L81'%!C/1'k!-!: 1U#. I: #0(*.!%2%5\$1\$!*6!*2812#!

 '*: +2105!/#&'#/01*2!*6!#/1'!@1L81'%8!: *41#\$0!FGH^!-\$\$*'1%01*2!6*&!C.+'%01*2!12!

 D*+&2%81\$: !%2.!=%\$\$!>*: +21'%01*20!X%\$(12:0*2A!W>0)
- P#&&#%+80A! = OA!7+%&#`A! O! <)* (++(&20'-)DO!EFGH^K! × (%0!. *#\$!10!: #%2!0*!L#!%!B*: %2!12!p12. 1#q!; %: #! \$0*&50#8012; k!Y%&&%014#!) &%: 12; !12!02. #/#2. #2085 | W#4#8*/#. !M1. #*!b%: #\$0!FGH^! \$\$*'1%01*2!6*&!C.+'%01*2!12!D*+&2%01\$: !%2.!=%\$\$!>*: +21'%01*20!×%\$(12;0*2A!W>0)
- * (++(&20'-)DJ)<!70%261#8. A!C0!EFGH_K! = *L18#!D*+&2%81\$: !%\$!f16#\$058#!D*+&2%81\$: k!) 1#8. !0 (#*&5!12!0 (#! 120#; &\01*2!*6!: *L18#!12!0 (#!2#B\$&**: !\02.!: *L18#!V*+&2\01\01*8!0!&*\01*2!/*6!\01*2!FGH_! -\$\\$*'1\01*2!6*\01*2!6*\01*2!12!D*+\02\018!: !\02.!=\\03\01*2!-\03\01*2!\01*
- * (++(&20'-)D0!P#&&#%+80A! = 0A! < !M%2!W5d#A! = 0!EFGH_K!?(#!P*B#&!*6!W1; 10%8! b%: #\$!12!W1\$%\$0#&! P&#/%&%01*2!%2. !P*\$0. 1\$%\$0#&!'' #\$181#2' #0!FGH_!020#&2%01*2%8!>*: : +21' %01*2! \$\$*' 1%01*20!7%2! W1#; *A!> 0!
- * (++(&20'-)D0! <!P%+&!Y0!EFGH_K!75: L*81'!>*24#&; #2'#!12!W#/1'01*2\$!*6!75&1%2!=1; &%20\$,!-!)%20%\$5! ? (#: #!-2%85\$1\$!*6!0(#!N+: %2\$!*6!Y#B! \vee *&d!\$#&1#\$!p?(#!75&1%2!-: #&1'%2\$0q!FGH_! 020#&2%01*2%8!>*:: +21'%01*2!-\$\$*'1%01*20!7%2!W1#; *A!>-0!

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f%; #18#'0+&#!
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DHGGG!EHGGIJGG!
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: %2%; 12; !%2.!
: #20*&12;!; &%. +%0#!
0#%' (12;!%$$1$0%20$000.
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-)%'+805!"#%\$\$1; 2#.!?1: #!'*: /#0101*2!EFGFHI! FGFFKI!^!; &%20\$!0*0%8!/&*41. #\$!%!*2#!\$#: #\$0#&!! *2#!'*+&\$#!#%\$#0!
- ?(#!7' (*8%&\$ (1/!6*&!W14#&\$105A!Cs+105A!%2.! 02'8+\$1*2!E7WC0K!; &%20!'*: /#0101*2!EFGFGA!FGFFK!! ^!; &%20\$!0*0%8!#%' (!5#%&A!SFTGG!%B%&.\$0!
- R" 3!" %8/(!C0!P*B#!D+21*&!)%' +805! C2(%2'#: #20! - B%&.!EFGFGIFGFHK!!!f1: 10#.! 7+L: 1\$\$1*2!>*: /#0101*2IT!; &%20\$!0*0%80!

! "#\$%& ' "(&)*+) , * ' ' - (./\$&.*(>'&3E%3/)@#44%''(()>(+L\\$()

!

- 6 (4N(+A!W#/%\0: #20!*6!>*: : +21'\%1*2!>(\%\8! - . 41\\$*\\$5!>*: : 100##!EFGFHIFGFFK!
- o 6(4N(+A!W#/%0: #20!*6!>*: : +21'%01*2! 70%%0#;1'!P8%2212;!>*: : 100##!
- C&\$20'P)?(H+("(3'&'%L(A!70+.#20!=#.1%!
 . 41\$*&5!@*%&. !EFGHZK!
- 6 (4N(+A!3214#&\$105!7+:: #&!"#%.12;!P&*;&%:!
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• @I &%-!7#21*&!7' (*8%&! \omega &\text{\omega}20! > *: /#0101*21!02! FGFFA!0 (#&#!B#&#!HZ!\text{\omega}/\text{\omega}1' \text{\omega}20! > *: /#0101*21!02! FGFFA!0 (#&#!B#&#!HZ!\text{\omega}/\text{\omega}1' \text{\omega}20! > *: /#0101*21!02! FGFFA!0 (#!\text{\omega} #\text{\omega} #\text{\omega}1' \text{\omega} #\text{\omega}1' \text{\omega} #\text{\omega}1' \text{\omega} #\text{\omega}1' \text{\omega} \text{\omega} #\text{\omega}1' \text{\omega} \text{\omeg

6 (4N(+)EFGFHIFGFhK0!?%\$d#.!B10(!*4#&\$1; (0!*6!%B%&.\$!%2.!0(#!&#\$#%&'(!/&*;&%: !*6!0(#!*&;%21`%01*20!02!0(1\$!#8#'0#.!/*\$101*24!0!B*&d!B10(!\$1U!*0(#&!\$'(*8%&\$!0*!%.41\$#!8#%.#&\$(1/!*2!&#\$#%&'(!2##.\$!*6!0(#!*&;%21`%01*2!%2.!(#8/!\$(%/#!0(#!'*26#'#a\$!&#\$#%&'(!*66#&12;\$0!!

- @#K\$I &%-!Y%6`1; #&IX (10#I7%8B#2!W1\$\$#&0%01*2!
 B%&.!>*: /#0101*2!!02!0(1\$!'%/%'105A!Q!: %2%; #.!
 0(#!.1\$\$#&0%01*2!'*: /#0101*2A!)#B12;!%8!
 .1\$\$#&0%01*2!\$+L: 1\$\$1*2\$!12!0(#!61&\$0!&*+2.!%2.!
 : %2%; 12;!)#B\$!6*&!0(#!\$#'*2.!&*+2.0!!
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 02!FGFHA!B#!)\$#.!0(#!YX7!%\$\$#\$\$: #20!&+L&1'!
 12!*&.#&!0*!/&*: *0#!12'8+\$14105,!/&*41.12;!
 %4#2+#\$!6*&!8%LIL%\$#.!.1\$\$#&0%01*2\$!E12'&#%\$12;85!
 /&*: 12#20!12!C+&*/#K!0*!&#'#14#!6%1&!%\$\$#\$\$: #200!
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<(&E!EFGHZIFGFGK0!02!0(1\$!'%/%'105A!Q!*4#&\$%B!0(#!
/&#\$#20%01*2!*6!f16#01: #!-'(1#4#: #20!-B%&.\$!6*&!
6*+2.12;!\$'(*8%&\$!B10(12!0(1\$!\$+L61#8.0!Q!\$+''#\$\$6+885!
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#2(%2'#.!*+0&#%'(!#66*&0\$!12!*&.#&!0*!\$/+&!;&%.+%0#!
\$0+.#20!124*84#: #20A!B*&d#.!B10(!-CD=>!8#%.#&\$(1/!12!*&.#&!0*!&#\$/*2.!#66#'014#85!0*!'*26#'#!'*: /81'%01*2\$!
12!%01*2!0*!0(#!'*&*2%41&+\$!/%2.#:1'!%2.!.#4#8*/#.!%!
6+2.12;!/&*;&%: !0*!(#8/!1212##.!6%'+805!%2.!;&%.+%0#!
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^%\$() < (&E!EFGH_IFGHZK0!02!0(1\$!'%/%'105A!0!/&#/%&#.! /10'(#\$!6*&!/%2#8!/&#\$#20%01*2\$A!2#;*01%0#.!0(*\$#!/10'(#\$! B10(!*0(#&!.141\$1*2\$!%2.!120#&#\$0!;&*+/\$A!%2.!612%885! *&;%21`#.!HG!/%2#8\$!L#0B##2!-CD=>!FGH^!%2.!-CD=>! FGHZ0!?(#\$#!12'8+.#.!%!:1U0+&#!*6!&#\$#%&'(A!0#%'(12;!%2.! 12.+\$0&516*'+\$#.!/%2#8\$0!

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!
*+#,(""%#3&0)C+((E#4)Q)?("H#3"%N%0%'P)@I &%!EFGHTI
FGH_K0!!
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: (M"0(''(+)5E%#+!EFGHFIFGHTK0!Q2!0(1$!'%/%'105A!Q!
12'&#%$#.!0(#!6&#s+#2'5!*6!2#B$8#00#&$!6&*: !0B*!01: #$!%!
5#%&!0*!s+%&0#&850!Q2!%..101*2A!Q!'*20&1L+0#.!0B*!%&01'8#$!%!
5#%&0!!
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P&*/*\$#.!/&*V#'0!6*&!0(#!5#%&,!!
pR%\$1\$!12!0(#!-//%%' (1%2!Y#B\$!W#\$#&0q,!
@&12;12;!=*L18#!D*+&2%11\$:!"#/*&012;!0*!
32.#&\$#&4#.!>*::+2101#\$!*6!"+&%!-//%%' (1%1!
%!S__AGGG!;&%20!/&*V#'0!0*!L#!\$+L:100#.!6*&!%!