

!"#\$%

&'##'(%)'(\*\$(+,#'"-%!

&./01234%251/ 6 37812!!

"#\$%&'!()\*(\*!%

+##%,-.%%!"//0.%%1!! !2.340&5.-&!67!8%9:;6<6\$9!!  
+,-\$;45&6-!=-,>.0%,&9?@=AB!!  
@:,. - : !CD!E 5 !\*FF!+,-\$;45&6-'  
AB!G\*H)(?F))!  
\$.0;40/ I J,-\$;45&6-K./#!!

'9:;37812%

GHH\*!!!!8;2'!=-,>.0%,&9!67!L,--.%6&4K!!L4M60!7,./!!N03.0,5.-&4<18%9:;6<6\$9K!!  
L,-60!7,./!!P6\$-,&,>.!@:,. - : .K!!"/>,%60!CO>,-\$!+,. /.054-'18;2K!!  
GHQF!!!!+ "'!P40<.&6-!P6<.\$.'!A60&7,./!!LAK!!8%9:;6<6\$9!P653#&.0!@:,. - : .K!!

&/15.0081234%&10878120%WWW

- ( )GR?!! L . 5 J . 0 ! " / ! ; 6 : ! : 6 5 5 , & & . . ! 4 - / ! & ; . - ! % & . . 0 , - \$ ! : 6 5 5 , & & . . ! 6 ! . % & 4 J < , % ; ! & ; ! !  
+04,-14-!/+. ; 4>,60!C54\$,-\$!P.-&.0!4&+,-\$;45&6-!=-,>.0%,&9!!
- ( )GR?!! " % % 6 : , 4 & . ! P ; 4 , 0 ! P . - & . 0 ! 7 6 0 ! C 5 4 \$ , - \$ ! 4 - / ! 8 . 0 : . 3 & # 4 < ! @ : , . - : . ' 1 4 - ! 6 0 \$ 4 - , S . / !  
0 . % . 4 0 : ; ! : . - & . 0 ! 4 & + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 K ! !
- ( )GF?!! P ; 4 , 0 ! + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 ! C - % & , & # & , 6 - 4 < ! E . > , . T ! + 6 4 0 / ! 7 6 0 ! U # 5 4 - !  
@ # J M . : & % ! E . % . 4 0 : ; ! !
- ( )GH?( \* ! 2 , 0 . : & 6 0 ! P 6 \$ - , & , > . ! 8 % 9 : ; 6 < 6 \$ 9 ! 3 0 6 \$ 0 4 5 ' ! + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 K ! !
- ( )GQ?GH! = - / . 0 \$ 0 4 / # 4 & . ! 2 , 0 . : & 6 0 ! 2 . 3 4 0 & 5 . - & ! 6 7 ! 8 % 9 : ; 6 < 6 \$ 9 ! + , - \$ ; 4 5 & 6 - ! = - , > ! !
- ( )G\*?!! 8 0 6 7 . % % 6 0 ! 2 . 3 4 0 & 5 . - & ! 6 7 ! 8 % 9 : ; 6 < 6 \$ 9 ! + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 K ! !
- ( )G(?GV!P ; 4 , 0 ! 2 . 3 4 0 & 5 . - & ! 6 7 ! 8 % 9 : ; 6 < 6 \$ 9 ! + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 K ! !
- ( )G)?G(!2,0.:&60!P6\$-,&,>.!8%9:;6<6\$9!306\$045'!+,-\$;45&6-!=-,>.0%,&9K!!
- ( )F?)H!P ; 4 , 0 ! 2 . 3 4 0 & 5 . - & ! 6 7 ! 8 % 9 : ; 6 < 6 \$ 9 ! + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 K ! !
- ( )W?G\*!" % % 6 : , 4 & . ! 8 0 6 7 . % % 6 0 ! 2 . 3 & & ! 6 7 ! 8 % 9 : ; 6 < 6 \$ 9 ! + , - \$ ; 4 5 & 6 - ! = - , > . 0 % , & 9 K ! !



&:>48;378120%

U,33'!2K'+<4g<.9'!NK'!d .0;40/%&.,-'!8K'!U,33'!AK'! j .- . /9'+K!X!L40g<.K!eK!^,-!30.%%\_K!!  
e;.!/,,\$,&4<!5 ./,4!6>.0#%.!%:4<.!^/ 5 6% k\_!"!5 6/#<40'!.0&. -/,J<.!4- /!  
1#.%&,6--4,0.!760!,-/.0,-\$!/,,\$,&4<!5 ./,4!6>.0#%.K!e.;;-6<6\$9'!L,-/'!4- /!  
+. ;4>,60K!!

2#\$\$4-'!AK'!X!d .0;40/%&.,-'!8K!^)(\* \_K! [ .>.<%!67!60,..-&4&,6-!J,4%!/ ,77.0!4:06%%!/,,\$,&4<  
:6-&. -&! :4&.\$60, .%1!C 5 3<,:4&,6-%!760!>,%#4<!3.0:.3&,6-K!8.0:.3&,6- 'V('!(G?(\*RK!!

+<4g<.9'!NK'!d4%3.<-'!AK'!X!d .0;40/%&.,-'!8K!^)((\_K!!e;.!/ .>.<63 5 . -&!67!6:#<6 5 6&60!  
%#330.%%,6-!67!%4<,-&!/,,%&04:&60%!, -! : ; ,</0. -K!b6#0-4<!67!



n4:g'!NK!'d.0;40/%&.,-'!8K'!L.<&S677'!"KLK'X!+400'EK!^()G\*\_K!GV?56-&;?6</%i!  
&04-%7.0!67!<.40-,-\$!J.&T..-!&6#:;!:0..-!4-!/0.4<?T60</!/,%3<49%1!![4-\$#4\$.!  
:#!4-!/!:6\$-,&,>.!<64/K!@:4-/-,-4>,4-!b6#0-4<!67!8%9:;6<6\$9'!VW'!()?(VK!s!!  
!!  
2,:g.0%6-'!jK'!d.0;40/%&.,-'!8K'!n4:g'!NK!X!+400'EK!^()G\*\_K!"\$.?0.<4&./!/:;4-\$.%!,-!  
<.40-,-\$!4:06%%!.40<9!::,</;66/1!!"- .T!,5,&4&,6-!&4%gK!!2.>.<635.-&4<!  
8%9:;6J,6<6\$9'!VV'!RGH?R\*(K!!  
!!  
d.0;40/%&.,-'!8K'!e%.'!bK'!2,:g.0%6-'!jK'!U,33'!2K'!X!L6%.0!"K!^()G(\_K!e;.!;#54-!  
>,%#4<!%9%&.5!#% .%!4!\$<6J4<!:<6%#0!.5.:;4-,%5K!!D,%6-!E.% .40:;'!RG'!GQ?(RK!!  
!!  
d.0;40/%&.,-'!8K'!2,:g.0%6-'!jK'!L,<<.0!@K'!X!U,33'!2K'^()G(\_K!!N40<9!63.04-&!<.40-,-\$!  
,%!#-477.:&./!J9!%6:,6?:6-65,:!&4&#%!4-!/16&:.0!/.56\$043;,:!74:&60%1!!"  
5.&44-4<9%,%K!!C-74-&!+.:4>,60!4-!/!2.>.<635.-&!\*V'!WR(?WRQK!!  
!!  
n;4-\$!rK'!B,-![K'!d.0;40/%&.,-'!8K'!X!U,33K!2K'^()G)\_K!!N030.%,6-?/0,>.-!%4<,-&!  
7.4&#0.%1!!+#JJ<.?J4%./!74:,4<!030.%,6-!%&#/9!J9!;#54-!4-!/!54:;,-.K!!C-!  
806:.. /,-\$!67!C!N!N!C-&.0-4&,6-4<!P6-7.0.-.:!6-!L#<&,5./,4!4-!/!N036!'CP LN!!  
( )G)!!P6-7.0.-.:!8#J<:,4&,6-\_'!@,-\$4360.'!GGQW?GGQH s !!!  
!!  
n4:g'!NK'+400'EK!'d.0;40/%&.,-'!8K'!2,:g.0%6-'!jK'!X!L.<&S677'!"KAK!^()H\_K!!C-74-&!  
,5,&4&,6-!7065!&.<.>,%6-!#%,-\$!-6>.<!&6#:;?%:0..-!&.:;6<6\$9K!!+0,&,%;!b6#0-4<!  
67!2.>.<635.-&4<8%9:;6<6\$9'!(R'!G\*?(FK!!  
!!  
d.0;40/%&.,-'!8K'!dK!@;0677'!jK!2,:g.0%6-'!X!@K!"K!" /<.0!^()H\_K!!e;./!/>.<635.-&!67!  
6JM.:&!0.-6\$-,&,6-!&06#\$;!,-74-:9K!!C-!^N/K%\_'!+K!PK!d<.-9-!X!EK!8K'n,-!'!A.T!  
2,0.:&,6-%!,-!2.>.<635.-&4<8%9:;6J,6<6\$9'!P;K!VK!!A6>4!@:.,.-.:!8#J<,%;.0%1!  
U4#334#\$.!AB'!=@ " K!!  
!!  
[,#'"K'!B4,-\$!2Kb'!d.0;40/%&.,-'!8K'!X!U%#!'@K!^()Q\_K!!E.<43%.!67!4:-.!76<<6T,-\$!  
,%6&0.&,-6,-!&0.4&5.-&!!"!0.&06%3.:&,>.!%&#/9!67!W)V!34&,-&%K!!b6#0-4<67!20#%\$!,-!  
2.054&6<6\$9'!R'!GVVW?HFGFK!!  
!!  
+4g.0!'e'K!e%.'!bK'!d.0;40/%&.,-'!8K'!X!" /<.0!@K!^()Q\_K!!P6-&6#0!,-&.\$04&,6-!J9!  
F56-&;?6</!,74-&%1!!2,%:0,5,-4&,6-!67!/,%&,-:!:6-&6#0!%;43.%K!!D,%6-!  
E.% .40:;'!WQ'!G\*F?GWQK!!



8.&.0%6-'!L K!" K'!d .0;40/%&.,-'!8X!L .-- . 5 ., .0!L K'!X!E43:%4g'!@K!nK!^GHHQ\_K!!h JM. :&?  
:.-&.0./!4&&. -&,6-4!J,4%.%14-!/6JM. :&!0. :6\$- ,&,6-! :6-&0,J#&,6-%!&6!% :.-.!  
%.\$5 .-&4&,6-!, -!<.7&?14- /!0,\$;&?; . 5,%3; .0. :?/45 4\$. /!34&., -&%K!!8%9: ;6J,6<6\$9!  
(F!\*VR?\*R)K!!

d .0;40/%&.,-'!8X!8.&.0%6-'!L K!8X!X!E43:%4g'!@K!nK!^GHHQ\_K!!" \$.?0.<4&. /!; . 5,%3; .0. :!  
4%95 5 .&09!,-!6JM. :&!/,% :0, 5, -4&,6-K!!b6#0-4<167!P<,-, :4<14- /!N03.0, 5 .-&4<!  
A.#063%9: ;6<6\$9'()'!GRW?GQVK!!

d .0;40/%&.,-'!8X! [ ,#!'bK'!X!E6>..?P6<<,.0!PK!^GHHQ\_K!!8.0: .3&#4<!:6-%&04,-&%!6-!, -74-&!  
5 . 5 609!0.&0, .>4<K!!b6#0-4<167!N03.0, 5 .-&4<!P; ,</!8%9: ;6<6\$9'!FH'!G)HG\*GK!!

U40&% ;60-'!j K'!E6>..?P6<<,.0!PK'!d .0;40/%&.,-'!8X!+; 4&&'!EK!@K'!j <.,-'!8X!" 406-'!K!  
c 6- /6<6%g,'!eK'!X! c #0&S.<'!AK!^GHHQ\_K!!2 .>.<63 5 .-&4<!:; 4-\$.%!,-!&; :!  
%3.: ,7, :&9!67!5 . 5 609!6>.0!&; :!7,0%&!9.40!67!<,7.K!!2 .>.<63 5 .-&4<18%9: ;6J,6<6\$9!  
\*\*!FG?RQK!!

" /<.0!'@K!" K'!C-%<; ;&'!@K!@K'!E6>..?P6<<,.0!PK'!X!d .0;40/%&.,-'!8X!^GHHQ\_K!!8.0: .3&#4<!  
4%95 5 .&0, .%14- /!5 . 5 609!0.&0, .>4<!, -!&; 0. .? 5 6-& ;?6</!, -74-&%K!!C-74-&!+ . ;4>.60!  
4- /!2 .>.<63 5 .-&!'!G'!(V\*?(R(K!!

U40&% ;60-'!j K'!E6>..?P6<<,.0!PK'!d .0;40/%&.,-'!8X!+; 4&&'!EK'! c 6- /6<6%g,'!eK'!j <.,-'!  
8X'!d ,<; :!'bK'!X! c #0&S.<'!AK'!X!P45 36%?/ .?P40>4<; 6'!L K!^GHHQ\_K!!e ; :!6-&6\$. -9!  
67!<.40,-,\$!4- /!5 . 5 609!6>.0!&; :!7,0%&!9.40?4- /?4; 4<7!67!<,7.K!!2 .>.<63 5 .-&4<!  
8%9: ;6J,6<6\$9'!\*(!FH?QHK!!

" /<.0!'@K!" K'!d .0;40/%&.,-'!8X'!X!E6>..?P6<<,.0!PK!^GHHQ\_K!! [ .>.<%?67?306: .%%,-\$!  
.77. :&!,-!, -74-&!5 . 5 609K!!P; ,</!2 .>.<63 5 .-&'!FH'!(Q)?(HWK!!

E6>..?P6<<,.0!PK'!X!d .0;40/%&.,-'!8X!!^GHR\_K!!e ; :!/.>.<63 5 .-&!67!, -74-&!5 . 5 609K!!!  
C-!AK!P6T4-!^N/K\_'!e ; :!/.>.<63 5 .-&!67!5 . 5 609!, -!; :</; 66/!^: ;K!(!33K!V?W)\_K!!  
U6>.!N4%&!@#% .0'!= j !!8%9: ;6<6\$9!80.%%K!!

+ ,./ .054-'!CK!d .0;40/%&.,-'!8X'!P663.0!NK!NK'!X!A.<%6-'!PK!" K!^GHR\_K!!U,\$; ?<.>.<!  
6JM. :&!0. :6\$- ,&,6-!T,& ;6#&14-!4-&.0,60!&. 5 3604<!6J.K!!A.#063%9: ;6<6\$4!\*V'  
(RG?(QRK!!

+ ,./ .054-'!CK'!X!d .0;40/%&.,-'!8X!!^GHHV\_K!!D. T36,-&?/ .3.- /.-&!5 . :; 4-, %5%!, -!  
>,%#4<!6JM. :&!0. :6\$- ,&,6-!E.3<9!&6!e400!4- /!+ #<& ;677!^GHHV\_K!!b6#0-4<167!  
N03.0, 5 .-&4<18%9: ;6<6\$9!U# 54-!8.0: .3&,6-!4- /!8.076054- :.'!(G'!GV)F?GVGWK!!

+ ,./ .054-'!CK!X!d .0;40/%&.,-'!8X!^GHH\*\_K!!E. :6\$- ,S,-\$! / .3& ;?06&4&. /!6JM. :&%!!  
N> ,/ .- :!4- /! :6- / ,&,6-!760!& ;0. .? / , 5 .-%,6-4<!, . T36,-&!, ->40,4- :.K!!b6#0-4<167!  
N03.0, 5 .-&4<18%9: ;6<6\$9!U# 54-!8.0: .3&,6-!X!8.076054- :.'!GH'!GGF(?GQ(K!!

+ ,./ .054-'!CK'!U# 5 5 .<'!bK!NK'! P663.0!NK!NK'! X! d .0;40/%&.,-'! 8X! PK!^GHH\*\_K!!@; 43.!  
0. :6\$- ,&,6-!, -!5, - /!J04, -!4- /!54; ;,-.K!!C-!8X!E#/65 .-!X!\K!P.0>4-&.%!^N/%K\_!

A.#06%:,.-:!!!\065!-.#04!-.&T60g%!\&6!40&7,,:4<!,-&.<<,\$.-:!!^33k!(Q(?H\*\_K!!  
+ .0<,-1!!@30,-\$.0?D.0<4\$K!!

+,./ .054-'!CK'!U#5 5 .<'!bK!NK'!d .0;40/%&.,-'!8K!PK!X!P663.0'!NK!NK!^GHH(\_K!!\065!  
,54\$!. /\$. %!\&6!\$.6-%!\&6!>,. T36,-&!,->40,4-&!6JM. :&!5 6/ .<%1!!"!'-. #04!- .&!  
,53<. 5 .-&4&,6-K!!C-!" 33<,:4&,6-%!67!40&7,,:4<!,-&.<<,\$.-:!!r1!!L4:;,-. !>,%6-!  
4- /!06J6&,:%!\^33K!VR)?VRQ\_K!!+ .<<,-\$;4 5 1!!@8CNK!!

U#5 5 .<'!bK!NK'!+,./ .054-'!CK'!d .0;40/%&.,-'!8K!PK!X!U,<&6-'!UK!bK!^GHQK!!\065!,54\$!.!  
./\$. %!\&6!\$.6-%!1!!"!:6--.:&,6-%&!433064:;K!!C-!2K!e6#0.&%g9'dK!U,-&6-'!X!eK!  
@.M-6T%g,!^N/%K\_!'!806:.. /,-\$%!67!&:;!GHQH!P6--.:&,6-%&!L6/ .<%!@#5 5 .0!  
@: ;66<!\^33K!WF(?WRG\_K!!@4-!L4&0.61!!L 60\$4-!j 4#7 5 4-K!!

? 32:0;/8@70%A29./%( .<8.B%C%"2%&/.@3/37812%%

e49<60'!dK'!d .0;40/%&.,-'!8K'!j 6<4gK!bK'!@4<4'!dK!X![,-\$T66/'!b!^#- / .0!0.>,. T\_K!!  
[ .40,-,\$!4- /!:6?



^())\*!h:&6J.0\_K!e;./!>.<635.-&167!>,.T36,-&!,->40,4-:!.!->.09!96#-\$!,-74-&%K!!  
C->,&./!:6<<61#,#5!30.%.-&4&,6-'!2.340&5.-&167!8%9:;6<6\$9!'B60g!=-,>.0%,&9!  
e606-&6!'P4-4/4K!!

^())('!@.3&.5J.0\_K!C->.%&,\$4&,-\$!6JM.:&!3.0:3&,6-!,-!,-74-:9K!!C->,&./!:6<<61#,#5!  
30.%.-&4&,6-'!2.340&5.-&167!8%9:;6<6\$9!'=-,>.0%,&9!67!@6#&;!\<60,/4!'e4534'\ [K!!

^())G!'A6>.5J.0\_K!!d4J60!34&;.%!4-!/,-74-&%i!/.&.:&,6-!67!:6-&6#0%K!!C->,&./!  
:6<<61#,#5!30.%.-&4&,6-'!D,%6-!c60g\$06#3!2.340&5.-&167!8%9:;6<6\$9!'P60-.<<!  
=-,>.0%,&9!'C&;4:4!'ABK!!

**D125./ .2;.%&/ .0.27378120%**

e49<60!'dK!'@4<4K!'dK!'j6<4g!'bK!'d.0;40/%&.,-'!8K!X![,-\$T66/'!bK!^())(\*!@.3&\_K!!26.%!  
4/#&?;,<!/!:6?#%./!/#0,-\$!/\$,&4<!5./,4!#%!.!,5306>.!:;,</0.-7%<.40-,-\$p!'!5.&4?  
4-4<9%,&%K!!86%&.0!&6J.!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!!+0,&,%;!  
8%9:;6<6\$,4<!@6:.,&9!'[6-/6-'!N-\$4-/K!!

2#\$\$4-'!AK!'!+<4g<.9!'NK!'!U4:g.0&'!DX!'!d.0;40/%&.,-'!8K!'!^A6>.5J.0!()(( \_K!!  
C-/,>./#4<!/77.0.-:.%!,!-!;,</0.-i%!60,.-&4&,6-!4-,%6&0639!4-/!/\$,&4<!5./,4!  
:6-%#53&,6-K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!C-&.0-4&,6-4<!  
@6:.,&9!760!2.>.<635.-&4<!8%9:;6J,6<6\$9!'@4-!2,.\$6!'P"K!!

+<4g<.9!'NK!'!U4:g.0&'!DX!'!2#\$\$4-'!AK!'!X!d.0;40/%&.,-'!8K!'!^A6>.5J.0!()(( \_K!!e;./!  
,-7<#.-:!.!67!.5.0\$.-&!<,&.04:9!6-!&;.!!\$<6J4!30.:./.-:!.!77.:&K86%&.0!30.%.-&./!  
4&!&;.!4--#4<!5..&,-\$!67!&;.!C-&.0-4&,6-4<!@6:.,&9!760!2.>.<635.-&4<!  
8%9:;6J,6<6\$9!'@4-!2,.\$6!'P"K!!

2#\$\$4-'!AK!'!+<4g<.9!'NK!'!U4:g.0&'!DX!'!d.0;40/%&.,-'!8K!'!^() (G\_K!P;4-\$,-\$!60,.-&4&,6-!  
4-,%6&0639!,-7<#.-:./!J9!&;.!!/\$,&4<!4\$.K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!  
67!&;.!C-&.0-4&,6-4<!@6:.,&9!760!2.>.<635.-&4<!8%9:;6J,6<6\$9!'P;:,4\$6!'C [K!!

2,;g.0%6-'!jK!'!2#77!'!LK!'!L6%.0!'!K!'!h<%.-!'!8K!'!X!8!d.0;40/%&.,-'!^A6>.5J.0!() (G\_K!  
@3...;!4-/!@6#-!/!P#.%!806>,/.!P653404J<.! [ .>.<%!67!\4:,<,&4&,6-!T;.-!  
P6-&06<<,-\$!760!@&,5#<#%!=--:0&4,-&9!N77.:&%K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!  
5..&,-\$!67!&;.!8%9:;6-65,:%!@6:.,&9!'A.T!h0<.4-%K!!

+<4g<.9!'NK!'!d4%3.<,-'!AK!'!X!d.0;40/%&.,-'!8K!'!^L49!'() (G\_K!!e;./!>.<635.-&167!  
6:#<656&60!#330.%&,6-!67!4<,-&!/\$,&04:&60%!,!-!;,</0.-K!!86%&.0!30.%.-&./!4&!&;.!!  
4--#4<!5..&,-\$!67!&;.!D,%6-!@:.,-:.%!@6:.,&9!'D,0&#4<L&\$K!!

8<4S4!'DX!'!0-4<![K"KLK!'!d.0;40/%&.,-'!8K!'!+.<<4?\ .0-4-/ .S!'LK!X![.6-'!bK!^"30,<!

+<4g<.9'!NK'!2#\$\$4-!X!d.0;40/%&.,-'!8K^()\_K!!e;.!\$<6J4<30.:./.-:!.77.:&!&;06#;\$;6#&!; ;,</;66/K 86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!C-&.0-4&,6-4!@6:,.&9!760!2.>.<635.-&4!8%9; ;6J,6<6\$9'D,0&#4<L&\$K!!

+<4g<.9'!NK'!@&6:gT.<<!j K'!2#\$\$4-'!AK'!d4%3.<-'!AK'X!d.0;40/%&.,-'!8K!!^h :&6J.0'!!()GH\_K!!P4-!; ;,</0.-!%#330.%%!4&&. -&,6-4!<43&#0.!J9!%4<., -&!/,%&04:&60%p!!86%&.0!!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!C-&.0-4&,6-4!@6:,.&9!760!2.>.<635.-&4!8%9; ;6J,6<6\$9'P; ;:4\$6'!C [K!!

2#\$\$4-'!2K'!NK!+<4g<.9'!NK!B454S4g,'!j K!@&6:gT.<<'! " K!L6%.0!X!8K!d.0;40/%&.,-'!^L49'!()GH\_K!@4: :4/ ; :!30.?4&&. -&,>.!5.4%#0.%!306>,/ .!,-%,\$;&!,-&6!,<<#%609! :6-&6#0!/ .&.:&,6-!,-!; ;,</0.-K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!D,%6-!@:; .-: .% !@6:; .&9!e4534'!\ [K!!

+<4g<.9'!NKPK'!2#\$\$4-'!AKPK'!h<%.-'!@K'!L6%.0!' K'X!d.0;40/%&.,-'!8K!!^L49'!()GH\_K!!e; .!\$<6J4<30.:./.-:!.77.:&!,-!; ;,</0.-!T,&;!4-!/!T,&;6#&!&;.!#%!.67!:653<.0! ,-%&0#:&,6-%K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!D,%6-!@:; .-: .% !@6:; .&9!e4534'!\ [K!!

h<%.-'!LK'!2#77!'! " K!L6%.0!' j K!2,:g.0%6-!X!8K!d.0;40/%&.,-'!^A6>.5J.0'!()GQ\_K!!@6#-!/\$#, /,-\$!>,%6-!#%,-\$!&;.!>,%#4!T60</!3404/,\$5!&6!/ ,0.:&<9!:65340.!%3...;!4-!/!6#-!/!:#.-,\$!54\$!.!%.40; ;K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!8%9; ;6-65; :!@6:; .&9!A.T!h0<.4-%!' [ " K!!

U,33'!2K'!@K!h<%.-'! " K!L6%.0!'X!8K!d.0;40/%&.,-'!^h :&6J.0'!()GQ\_K!!L,-/? :047&!U6T! /,\$&4<!5./ ,4!.03.0,.-: .!; ;4-\$.%!&;.!>,%#4!5,-/K!!86%&.0!30.%.-&./!4&!&;.!(-/!



5..&,-\$!67!&;.!C-&.0-4&,6-4!@6:,.&9!760!2.>.<63 5 .-&4!8%9:;6J,6<6\$9  
c 4%;,-\$&6-'!2 PK!!

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n,5 5 .054--'[K'L6%.0'"K'!2,:g.0%6-'!j K'!d0.-.<<'! "K'+400!EK'!d .0;40/%&.,-'!8X!!  
^()GW!b#<9\_!!!=%,-\$!3#SS<.%!&6!4%%.%%!&;!.!77.:&%!67!3.0:.3&#4<!:#.%!6-!%6:,4<!  
<.40-,-\$!%&04&.\$9!,-!(W? 5 6-&;?6</%K!!86%&.0!30.%.-&./!4&!&;.!J,?4--#4! 5 ..&,-\$!67!  
&;.!C-&.0-4&,6-4!P6-7.0.-:!.!6-!C-74-&!@&#/,.%'+.0<,-'!2EdK!!

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L6%.0!' "K'! 2,:g.0%6-'! j K'! L6-.<<'! "K'! [..!' UK'! n,5 5 .054-'! [K'! +400! EK'! X!  
d .0;40/%&.,-'!8X!!^()G\*!h:&6J.0\_K!!e04-%7.0!<.40-,-\$!4:06%%!%6:,4<!.40-,-\$!:6-&.0&!,-!  
(KV?!4- /!\*?

2,,:g.0%6-'!j K'd.0;40/%&.,-'!8K'!X!+400'!EK!^()G('!b#- .\_K!!e ; !.77. :&!67!,-%&0#:&,6-%!  
6-!,5,&4&,6-!7065!<,>.!4- /!>, / .6! / .5 6-%&04&,6-%K!!86%&.0!30.%.-&./!4&!&; !  
J,4--#4<!5 . .&,-\$!67!&; !.C-&.0-4&,6-4<!P6-7.0.-: .!6-!C-74-&!&#/,.%!  
L,-.436<,%!'!LAK!!

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U,33'!2K'!L6%.0!'K[K'!hiP6--.0'!L K!X!d.0;40/%&.,-'!8K!^()G('!L49\_K!!e ; !.5 34:&!67!  
:<6%#0.!6-!:6-&6#0! / .&.:&,6-!&;0.%;6</%!, -!; ;</0.-!4- /!4/#<&%K!!86%&.0!30.%.-&./!  
4&!&; .!4--#4<!5 . .&,-\$!67!&; !.D,%6-!@:.,-: .%!@6:.,&9'!A43<.%!' \ [K!!

!!

U,33'!2K'!d.0;40/%&.,-'!8K'!n;4-\$!r K'!B,-'[K'![4\$#,6'!bK!X!b4-g6T'!PK!^()GG'!  
A6>.5 J.0\_K!N%&,5 4&,-\$!3.0: .3&#4<!J,4% .%!5 . / ,4&,-\$!74: ,4<!.030.%%,6-!  
:<4% ,7: ,4&,6-!,-!4/#<&%!4- /!; ;</0.-!#%, -\$!0.>.0% !:600.<4&,6-K!!86%&.0!30.%.-&./!  
4&!&; .!4--#4<!5 . .&,-\$!67!&; !.C-&.0-4&,6-4<!@6:.,&9!760!2 .>.<63 5 . -&4!  
8%9: ;6J,6<6\$9! c 4% ;,-\$&6-!2 PK!!

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2,,:g.0%6-'!j K'!L :C-&90.'!8K'!h6&'!NK'!B46'!PK'!d.0;40/%&.,-'!8K'!X!+400'!EK!^()GG'  
A6>.5 J.0\_K!!@&04&.\$,%!760!.-;4-:,-\$!.-:6/,-\$!67!,-760 5 4&,6-!706 5 !%:0.-!  
5 . / ,4K!!86%&.0!30.%.-&./!4&!&; .!4--#4<!5 . .&,-\$!67!&; !.C-&.0-4&,6-4<!@6:.,&9!760!  
2.>.<63 5 . -&4<!8%9: ;6J,6<6\$9! c 4% ;,-\$&6-!2 PK!!

!!

2,,:g.0%6-'!j K'!L :C-&90.'!8K'!+400'!EK!X!d.0;40/%&.,-'!8K!^()GG'!L49\_K!!e ; !.77. :&!67!  
0.3.&,6-!4- /! .036%#0. /!#04&,6-!6-!&; !>, / .6! / .7. :&!77. :&K!!86%&.0!30.%.-&./!4&!&  
&; .!4--#4<!5 . .&,-\$!67!&; !." 5 .0: ,4-!8%9: ;6<6\$, :4<!@6:.,&9! c 4% ;,-\$&6-!2 PK!!

+400'!EK'!2,,:g.0%6-'!j K'!d.0;40/%&.,-'!8K'!n4:g'!NK'!\04-g'!UK'!L :C-&90.'!8K'!X!@;#<.0'  
bK!^()GG\_K!!e ; !306&04:&./!>, / .6! / .7. :&!N04 5 ,,-\$!G?&6!W?9.40?6</%i!, 5,&4&,6-!  
67!4!3#SS<.!&4%gK!!86%&.0!30.%.-&./!4&!&; .!4--#4<!5 . .&,-\$!67!&; !.N4%&.0-!  
8%9: ;6<6\$, :4!"%&6: ,4&,6-!+6%&6-'!L " K!!

2,,:g.0%6-'!j K'!d.0;40/%&.,-'!8K'!n4:g'!NK'!+400'!EK!^()G)'!A6>.5 J.0\_K!e ; !>, / .6!  
/ .7. :&!77. :&! [ .40-,-\$!&; !.5 .4-%!4- /!&; !. - /%!706 5 !<,>.!4- /!>, / .6!  
/ .5 6-%&04&,6-%K!!86%&.0!30.%.-&./!4&!&; .!4--#4<!5 . .&,-\$!67!&; !.C-&.0-4&,6-4<  
@6:.,&9!760!2 .>.<63 5 . -&4<!8%9: ;6J,6<6\$9!@4-!2,.\$6'!P " K!!

U,33'!2K'!L,<<.0'!@K'!d.0;40/%&.,-'!8K'!X!2,,:g.0%6-'!j K!^()G)'!A6>.5 J.0\_K!!e ; !  
0.<4&,6-!67! / .5 6\$043: ,: !>40,4J<.%!&6!4%#6: ,4&,6-!&40-,-\$!,-!,-74-:9K!!86%&.0!  
30.%.-&./!4&!&; .!4--#4<!5 . .&,-\$!67!&; !.C-&.0-4&,6-4<!@6:.,&9!760!2 .>.<63 5 . -&4!  
8%9: ;6J,6<6\$9!@4-!2,.\$6'!P " K!!

U,33'!2K'!d.0;40/%&.,-'!8K'!P60J.&&'!EK'!n;4-\$!r K'!X!B,-'[K!^()G)'!L49\_K!!e.%&,-\$!  
.5 6&,6-4<!.030.%%,6-!0: .6\$-,&,6-!T,&;!4-!4/43&4&,6-!67!&; !.' +#JJ<.%a!5 4%g,-\$!  
433064: ;K!!86%&.0!30.%.-&./!4&!&; .!4--#4<!6-7.0.-: .!67!&; !.D,%6-!@:.,-: .%!  
@6:.,&9'!A43<.%!' \ [K!!

!!

2,:g.0%6-!'j k'!8K!d.0;40/%&.,-'!NK!n4:g'!X!EK!+400K!^()G)!L40:;\_K!e:;!>./ .6!/ .7,:;&!  
,-!6</ .0!::;</0.-!N03<60,-\$!&4%g!/,77,:#<&9!4%!4!3.076054-: .?<,5 ,&,-\$!74:&60K!!  
86%&.0!30.%.-&./!4&!&;;!J,?4--#4<!5 . .&,-\$!67!&;;!C-&.0-4&,6-4<!P6-7.0.-:;!6-!  
C-74-&!@&#/,.%!'!+4&,560.'!L 2K!!

!!

d.0;40/%&.,-'!8K'!j K!2,:g.0%6-!'NK!n4:g'!X!EK!+400K!^())H'!h:&6J.0\_K!! [.40-,-\$!7065!  
%:0..-!5./,4!,-!6</ .0!,-74-&%1!!"-! .0&.-%,6-!67!&;;!>./ .6!/ .7,:;&! .77.:&K!!e4<g!  
30.%.-&./!4&!&;;!4--#4<!5 . .&,-\$!67!&;;!C-&.0-4&,6-4<!@6:,.&9!760!2.>.<635 . -&4<!  
8%9:;6J,6<6\$9'!P;,:4\$6'!C [K!!

!!

n4:g'!NK'!bK!n6::4'!EK!+400'!X!8K!d.0;40/%&.,-K!^())H'!h:&6J.0\_K!!L 6&:.0%!. -;4-:!  
,-74-&%i!( 2? \* 2 !&04-%7.0!67!<.40-,-\$K!86%&.0!30.%.-&./!4&!&;;!4--#4<!5 . .&,-\$!67!  
&;;!C-&.0-4&,6-4<!@6:,.&9!760!2.>.<635 . -&4<!8%9:;6J,6<6\$9'!P;,:4\$6'!C [K!!

!!

2,:g.0%6-!'j k'!d.0;40/%&.,-'!8K'!n4:g'!NK'!+400'!EK'!X!L.<&S677'!"K!^())H'!h:&6J.0\_K!  
e:;!>./ .6!/ .7,:;&! .77.:&K!86%&.0!% .%,6-!30.%.-&./!4&!&;;!b6,-&!"&&. -&,6-!  
P6-7.0.-:.'!+6%&6-!L " K!!

!!

@;0677'!dK'!"K!L,04J.<'!X!8K!d.0;40/%&.,-!^())H'!L49\_K!!P4-!56&,6-!:#.%!74:;<,&4&!  
:6-7,\$#04<!74:;!306: .%, -\$, -!::;</0.-p!!86%&.0!30.%.-&./!4&!&;;!4--#4!  
:6-7.0.-:;!67!&;;!D,% ,6-!@:,. -: .% !@6:,.&9'!A43<.%'\ [K!!

!!

hZE,60/4-'!L K'!j K!8.4J6/9'!PK!"<<,6-!'@K!+406-?P6; .-'!8K!d.0;40/%&.,-'!X!dK!C406:; .!  
^())H'!L49\_K!!@#3.0,60!>,%#4<!% .40:;!,-\*!9.40!6</!/:;,</0.-!T,&;;!4#&,5 K!!86%&.0!  
30.%.-&./!4&!&;;!4--#4<!C-&.0-4&,6-4<!L . .&,-\$!\ 60!"#&,5 !E.% .40:;!'P;,:4\$6'  
C [K!!

!!

n4:g'!NK'!EK!+400'! [K!@;#;g'!NK!@3.0<.'!j K!2,:g.0%6-!'8K!d.0;40/%&.,-'!X!"K!L.<&S677!!  
^())Q'!A6>.5J.0\_K!!26!<4-\$#4\$ .!:#.%!74:;<,&4& .!:06%?/,5 .-%,6-!&04-%7.0!,-!  
GV56-&;?6</%p!!86%&.0!30.%.-&./!4&!&;;!4--#4<!5 . .&,-\$!67!&;;!C-&.0-4&,6-4<!  
@6:,.&9!760!2.>.<635 . -&4<!8%9:;6J,6<6\$9'!c4%;,-\$&6-!'2PK!!!

!!

@;0677'!dK'!d.0;40/%&.,-'!8K'!X!B,-'! [K!^())Q'!"#\$%&\_K!P;,</0.-Z%!% .-%,&,>,&9!&6!  
:6-7,\$#04<!:#.%!, -!74: .% !#- / .0\$6,-!\$06&4&,6-4<!56&,6-K!!86%&.0!30.%.-&./!4&!&;;!!  
Q&;!C-&.0-4&,6-4<!P6-7.0.-:;!6-!"#&654&,:!\4: .!4- /!d.%&#0.!E.:6\$-,&,6-!  
^ \ dE)Q\_!@.3&K!())Q'!"5%&.0/45'!e:;!A.&;.0<4- /%K s !!

!!

n4:g'!NK'!EK!+400'! [K!@;#;g'!NK!@3.0<.'!dK!@;0677'!j K!2,:g.0%6-!'@K!L,<<.0'!8K!  
d.0;40/%&.,-'!X!"K!AK!L.<&S677^())Q'!L40:;\_K!C-74-&%!74,<!4&!4!&04-%7.0!67!  
<.40-,-\$!&4%g!7065!( 2!&6!\* 2!4- /!\* 2!&6!( 2K!!86%&.0!30.%.-&./!4&!&;;!J,?4--#4<!  
5 . .&,-\$!67!&;;!C-&.0-4&,6-4<!P6-7.0.-:;!760!C-74-&!@&#/,.%!'!D4--:6#>.0'!P4-4/4K!!

!!

E.,<<9'!dK'!j K!2,:g.0%6-!'dK!@:;0677'!bK!A.<%. -!'X!8K!d.0;40/%&.,-!^())Q'!L40:;\_K!e:;! .!  
.77.:&!67!% ;40./!340&%!4- /!%34&,4<!:6-7,\$#04&,6-!6-!>,%#4<!% .40:;!3.076054-: .!,-!

96#-\$!; ;</0.-K!!86%&.0!30.%.-&./!4&!&;;!J,?4--#4<!5..&,-\$!67!&;;!C-&.0-4&,6-4<!  
P6-7.0.-:;!760!C-74-&!@&#/,.%!'!D4-:6#>.0!'P4-4/4K!!

!!

d.0;40/%&.,-'!8K!!^())R!'A6>.5J.0\_K!!C-74-&%Z!3.0:.3&,6-!67!:6-&6#0%!,-&!&;;!4J%.--:;!67!  
:6-&04%&!60!J0,\$;&-.%%!:#. %K!!C->,&./!30.%.-&4&,6-1!!@.>.-&;!C-&.0-4&,6-4<!!  
P6-7.0.-:;!6-!N3,\$.-&,:!E6J6&,:%1!!L6/.<,-\$!P6\$-,&>.!2.>.<635.-&!,-!!  
E6J6&,;!@9%&.5%'!E#&\$\$.0%!=,->.0%,&9!'A.T!+0#-%T,:g!'AbK s !!

!!

n4:g!'NK'+400!'EK'!@;#;g!'[K'!2,:g.0%6-'!jK'!L,<<.0!'@K'!d.;40/%&.,-'!8K'!X!L.<&S677!  
"K!AK!!^())R!'h:&6J.0\_K!!P06%?/,5.-%,6-4<!&04-%7.0!,!GV?56-&;?6</%1!!C5,&4&,6-!  
7065!\*2!&6!(2!X!(2!&6!\*2K!!86%&.0!30.%.-&./!4&!&;;!4--#4<!5..&,-\$!67!&;;!  
C-&.0-4&,6-4<!@6:,.&9!760!2.>.<635.-&4<!8%9;:6J,6<6\$9'!@4-!2,.\$6!'P"K!!

@;0677!'dK'!E.,<<9!'dK'!A.<%6-'!bK'!2,:g.0%6-'!jK'!X!d.0;40/%&.,-'!8K!!^())R!'L49\_K!!  
e;.!77.:&!67!%;40./!340&%!4-!/!%34&,4<!6-7,\$#04&,6-!6-!>,%#4<!%.40:;!  
3.076054-:;!,-!96#-\$!; ;</0.-K!!86%&.0!30.%.-&./!4&!&;;!4--#4<!6-7.0.-:;!67!&;;!  
D,%6-!@:,.-%!@6:,.&9'!@404%6&4'!\ [K!!

e% .K'!bK'+4g.0!'eK'!" /<.0!'@K'!X!d.0;40/%&.,-'!8K!!^())R!'L49\_K!!e;.!06<.!67!4T40.-.%%!  
,-!%4::4/,!:6-/,&,6-,-\$K!!86%&.0!30.%.-&./!4&!&;;!4--#4<!6-7.0.-:;!67!&;;!  
D,%6-!@:,.-%!@6:,.&9'!@404%6&4'!\ [K!!

L,<<.0!'@K'!@;0677!'dK'!d.0;40/%&.,-'!8K'!n4:g!'NK'!hi+0,-'!NK'!L.<&S677'"K'!X'+400!'EK!!  
^())R!'L40:;\_K!!C5,&4&,6-!7065!&6#;:%:0.-%J9!H?!4-!/!GV?56-&;?6</%K!!86%&.0!  
30.%.-&./!4&!&;;!4--#4<!5..&,-\$!67!&;;!@6:,.&9!760!E%.40:;!,!-!P;,</!  
2.>.<635.-&!+6%&6-'!L"K!!

e%.'!bK'!X!d .0;40/%&.,-'!8K!!^())V'!L49\_K!!"!;,\$; .0?60/.0!5 .:;4-,%5!J.96-/\$66/!  
:6-&,-#4.0



j 04. J .<! j K!X!d .0;40/%&.,-'!8K!!^())('!" 30,<\_K!!D,. T36,-&!,->40,4-:!.!760!5#<&,?340&!  
6JM.:&%!4&!\*!56-&;%!67!4\$.K!!86%&.0!30.%.-&./!4&!&;.!!C-&.0-4&,6-4<!P6-7.0.-:!.!6-!  
C-74-&!@&#/,.%!'!e606-&6'!P4-4/4K!!

d.0;40/%&.,-'!8K'![4%%&.0!'@K'!X!P64&.%!'2K!!^GHHH'" 30,<\_K!!2.>.<635.-&4!74:&60!,-!  
:;</0.-i%!>,%#4<!%.40:;K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!N4%&.0-!  
8%9:;6<6\$, :4!"%%6:,4&,6-'!806>,/.-:.'!ECK!!

2,&0.'!bK'!X!d.0;40/%&.,-'!8K!!^GHHH'" 30,<\_K!!e;0..?56-&;?6</%i!/.&.:&,6-!67!:<6%#0!,-!  
&;.!4J%.-:.'!67!<6:4<!:#.%K!!86%&.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!N4%&.0-!  
8%9:;6<6\$, :4!"%%6:,4&,6-'!806>,/.-:.'!ECK!!

d.0;40/%&.,-'!8K'!E.--.0!'8K'!X!E6>..?P6<<,.0!'PK!!^GHHQ'" 30,<\_K!!C-74-&%!/,%:0,5,-4&!  
:6<60%!6-!&;.!J4%,%!67!3.0:.3&#4!/,%&4-:.'!-6&!:4&.\$609K!!86%&.0!30.%.-&./!4&!&;.!  
5..&,-\$!67!&;.!C-&.0-4&,6-4!P6-7.0.-:.'!6-!C-74-&!@&#/,.%!'!&<4-&4!'d"K!!

8.&.0%6-'!LK"K'!/.'!d.</.'!+K'!E43:%4g'!@KnK'!d.0;40/%&.,-'!8K'!X!+4:;6#/?[.>,'!K!!  
^GHHQ'" 30,<\_K!!"/6#J<./!,%%6:,4&,6-!J.&T..-!,53<:,&!4-!/!.03<:,&!6JM.:&!  
0.:6\$-,&,6-!306:..%!.%10.>.4<./!J9!7,\$#0.?\$06#-!/!%.\$0.\$4&,6-K!!86%&.0!30.%.-&./!  
4&!&;.!4--#4<!5..&,-\$!67!&;.!'!%%6:K!760!E.%40:;!,-'!D,%6-!4-!/!h3;&;4<56<6\$9!  
\&K![4#/ .0/4<.'!\ [K!!

d.0;40/%&.,-'!8K'!E6>..?P6<<,.0!'PK'!X!" /<.0!'@K!"K!!^GHHR'" 30,<\_K!!\*?56-&;?6</%!%;6T!  
4!/,%%6:,4&,6-!,-!5.5609!760!%,S.K!!843.0!30.%.-&./!4&!&;.!4--#4<!5..&,-\$!67!&;.!  
N4%&.0-!8%9:;6<6\$, :4!"%%6:,4&,6-'!c4%;,-\$&6-'!2PK!!

d.0;40/%&.,-'!8K!!^GHHR'" 30,<\_K!!E.4:&,6-!&,5.!5.4%#0.%!67!>,%#4<!%.40:;!4&!G'(!'4-!/!\*!  
9.40%!67!4\$\$.K!!86%&.0!30.%.-&./!4&!&;.!5..&,-\$!67!&;.!'@6:.,&9!760!E.%40:;!,-'!  
P;,</!2.>.<635.-&!c4%;,-\$&6-'!2PK!!





&10791;71/34\F.441B0%

%!

!! L4&&;.T!c,-/%60!8;2!!()GW?GV!!

!! d.554!e49<60!8;2!!()G\*?GW!!

!! j,5J.0<9!j04.J.<!8;2!!()G?)W!!

%!

(.5./2;.0%

!! E.7.0.-:.%!">4,<4J<.! =36-!E.1#.%&!!